ÍNDEX

ETSEIB

N.TRACTAMENT DE LES DADES

Els passos per a tractar les dades són els següents: tenim un seguit de registres de dades apuntats manualment (SQM) o bé en un arxiu tipus CSV (comma separated vàlues) si és l'SQM-LU. En aquest registre tenim cada mesura presa, juntament amb dia, mes, any i hora, latitud i longitud, com a valors més importants. Aquestes dades s'han de posar en un arxiu .xls (adjunts al CD), i després s'han de seguir les instruccions descrites al propi arxiu. L'arxiu genera dos resultats: per una banda, un gràfic circular en el que es representen els valors de les mesures per a cada sector de la cúpula celeste, i per l'altra un arxiu tipus KLM (gràcies a una macro), executable amb l'aplicació Google Earth©. Aquest segon és un llistat de punts ubicats geogràficament, on en cada punt es veuen els valors representats al gràfic circular, però en forma de taula.

Hi ha dos arxius .xls diferenciats entre SQM i SQM-LU, ja que els angles de mesura i en conseqüència els gràfics són diferents.

La macro que genera l'arxiu KML és una implementació de la macro creada per simon_a, de lliure accés al web https://groups.google.com/.

N.1. Funcionament de l'arxiu excel per al model SQM normal

L'arxiu excel està separat per pestanyes, cada una corresponent a un pas del procés.

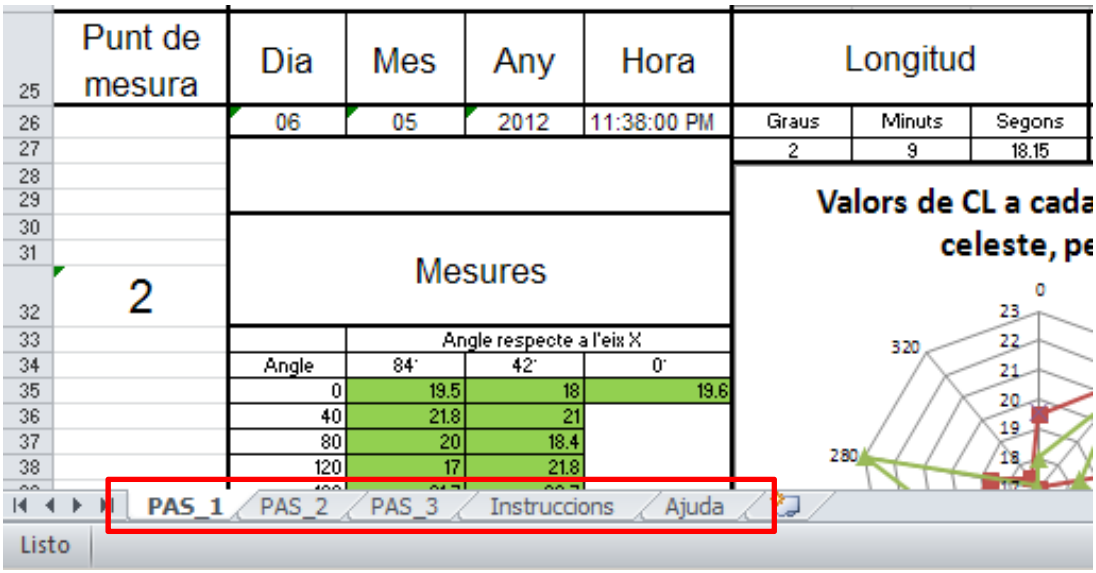


Fig. N.1 – Pestanyes a l'arxiu excel per a l'SQM normal

N.1.1. Pas 1 – Introducció de les dades

L'usuari ha de posar les dades recollides a la primera pestanya. Les dades a introduir són la data de la mesura, l'hora, la longitud (EST) i latitud (NORD) i després el valor de cada una de les posicions mesurades amb l'SDNC.

Taula de mesures per al model SQM normal

Punt de mesura	Dia	Mes	Any	Hora	Longitud			Latitud		
	05	05	2012	11:35:44 PM	Graus	Minuts	Segons	Graus	Minuts	Segons
					1	58	29.74	41	23	31.44
1	Mesures									
		Angle respecte a l'eix X								
	Angle respecte a l'eix Z	84°	42°	0°						
	0	17	18	19.6						
	40	22	21							
	80	20	18.4							
	120	22.5	19.8							
	160	21.7	22.7							
	200	18.7	18.7							
	240	20.1	20							
	280	22.9	23							
	320	17.4	17.8							
	Nota: Les caselles a omplir són les marcades en color verd. Si l'usuari hi introdueix un valor no valid, aquesta quedarà marcada de color vermell									

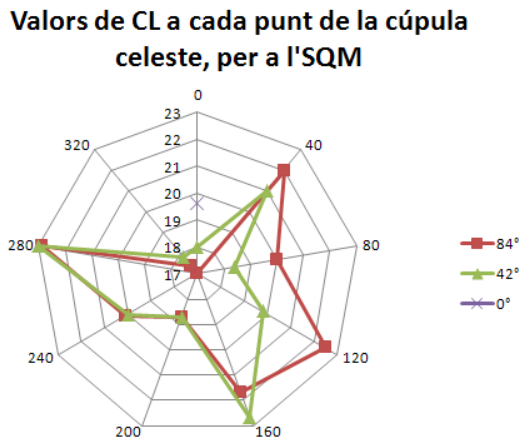


Fig. N.2 – Pas 1

Per ajudar a l'usuari a evitar errors en la introducció de les dades, les cel·les de mesures contenen format condicional. Si la mesura introduïda està compresa entre 17 i 23 (que és el rang de l'SQM, la cel·la es posa de color verd. En qualsevol altres cas la cel·la romandrà de color vermell.

Com es pot veure a la figura N.2, el genera un gràfic circular amb la representació dels valors de CL mesurats amb l'SQM.

N.1.2. Pas 2 – Introducció de les dades de la macro

A la segona pestanya l'usuari haurà de fer una operació de copiar-enganxar. La macro no pot tenir cel·les d'on extreu la informació referenciades a altres cel·les, de manera que és necessari un pas intermedi.

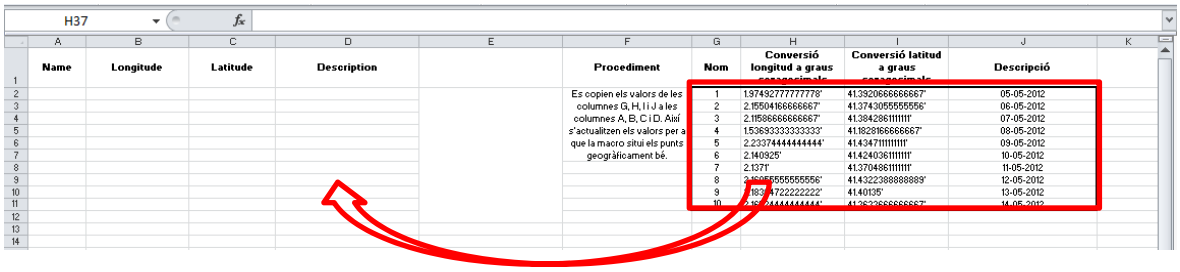


Fig. N.3 – Pas de copiar i enganxar

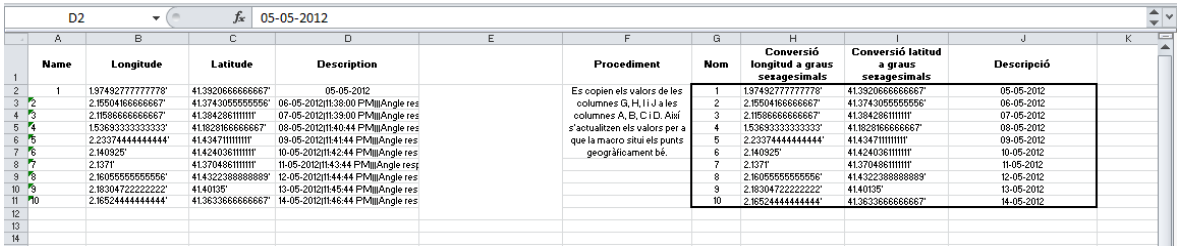


Fig. N.4 – Cel·les copiades a la posició de macro

N.1.3. Pas 3 – Nom de l'arxiu i ruta d'accés

La tercera pestanya fa referència a les característiques de l'arxiu. Només cal omplir la casella amb la ruta on es vol guardar l'arxiu i el seu nom, i també el nom del llistat de punts, entre d'altres.

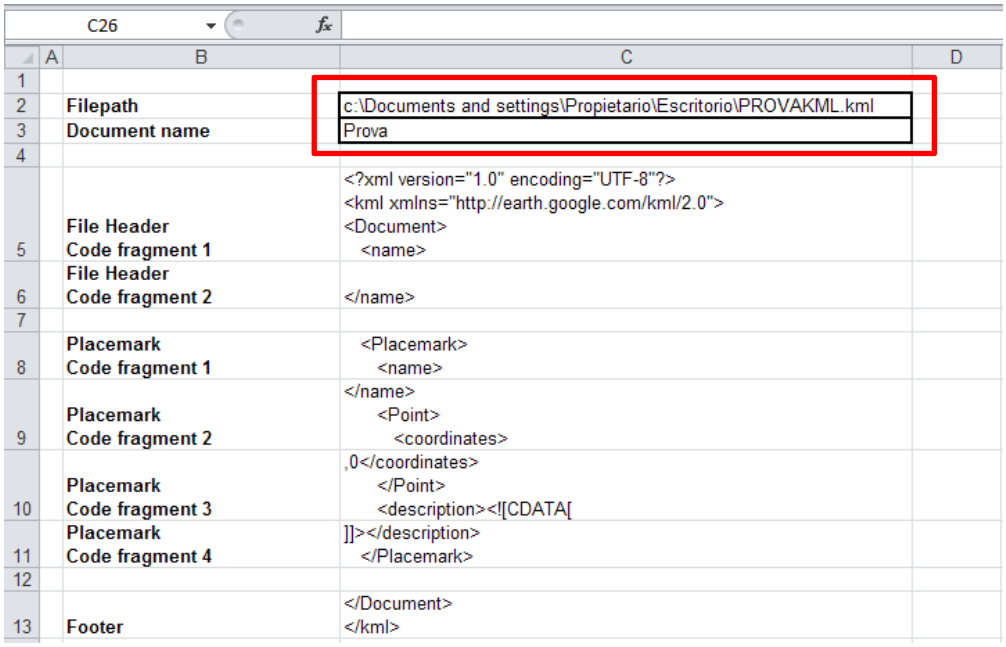


Fig. N.5 – Tercera pestanya. Nom i ruta d'accés de l'arxiu

ETSEIB

Després de les tres pestanyes ja podrà executar la macro (prement Alt + F8), i es generarà l'arxiu KML.

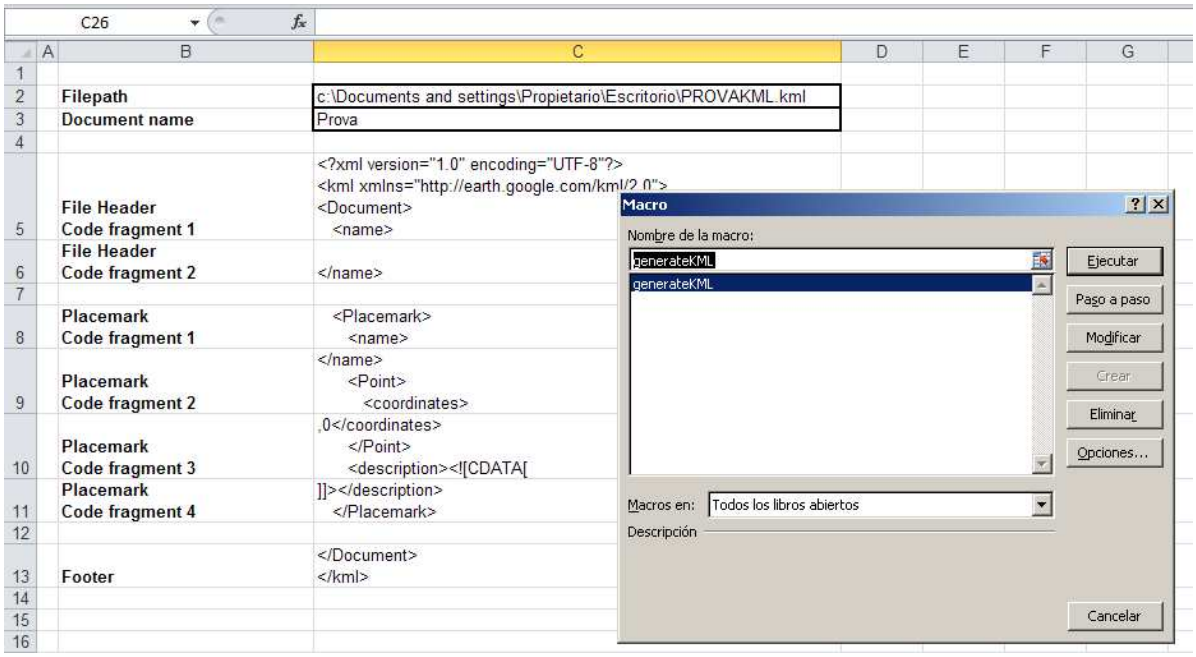


Fig. N.6 – Finestra de la macro i creació de l'arxiu KML

L'arxiu .xls està dissenyat per a 10 punts de mesura, però es pot ampliar a tants punts com es vulgui.

Aquesta macro té l'inconvenient de que necessita rebre les coordenades de longitud i latitud en graus, però els instruments de mesura acostumen a donar-los en graus, minuts i segons. El primer pas a resoldre és fer aquesta conversió d'unitats. Un grau sexagesimal (la unitat que necessitem) són seixanta minuts sexagesimals, de manera que només s'han de dividir els minuts per 60 i els segons per 3600, i la conversió està feta. Aquest pas es farà automàticament a la segona pestanya PAS_2, com s'havia comentat prèviament.

El segon inconvenient de la macro és que si en una pestanya tenim el formulari a omplir per l'usuari i a la següent la taula de valors que utilitza la macro, no es poden crear referencies directes cel·la a cel·la, sinó que s'ha de crear un pas intermedi. Quan l'usuari posi les dades a la primera pestanya, aquestes s'actualitzaran automàticament a la segona. L'únic que haurà de fer és obrir la segona pestanya, copiar els valors generats i enganxar-los a les cel·les de la macro.

Seguidament, donarà el nom a l'arxiu KML i també la ruta on vol que es guardi a la tercera pestanya, i ja podrà executar la macro.

N.2. Funcionament de l'arxiu .xls per al model SQM-LU

El procediment és exactament el mateix que per a l'SQM normal, amb la diferència de que els valors inicials s'han de passar de l'arxiu CSV a l'.xls. Enganxant-los, ja es té una taula de referència per a començar a passar els valors a la pestanya del PAS_1.

El primer pas és diferent, ja que el nombre de passos per a cobrir tota la cúpula celeste és diferent.

Taula de mesures per al model SQM-LE

Punt de mesura		Dia	Mes	Any	Hora	Longitud			Latitud		
		05	05	2012	11:35:44 PM	Graus	Minuts	Segons	Graus	Minuts	Segons
						1	58	29.74	41	23	31.44
1	Mesures										

Angle respecte a l'eix Z	Angle respecte a l'eix X: 80	60	40	20	0°
0	17	17.1	18	18	19.6
20	19	18.2	21	22.9	
40	22	17.4	21.6	21	
60	18.2	20.7	22.9	18.2	
80	20	21.6	20.7	18.4	
100	17.3	21	18.2	21.6	
120	22.5	17.3	20.7	19.8	
140	22.9	17.4	22.9	21	
160	21.7	17.3	21.6	22.7	
180	20.7	22.9	17.4	22.9	
200	18.7	21.6	18.2	18.7	
220	21.6	18.2	20.7	21.6	
240	20.1	17.3	22.9	20	
260	21	22.9	17.3	18.2	
280	22.9	20.7	17.4	23	
300	18.2	18.2	21.6	20.7	
320	17.4	20.7	18.2	17.8	
340	17.4	22.9	21	17.8	

Nota: Les caselles a omplir són les marcades en color verd. Si l'usuari hi introdueix un valor no valid, aquesta quedarà marcada de color vermell

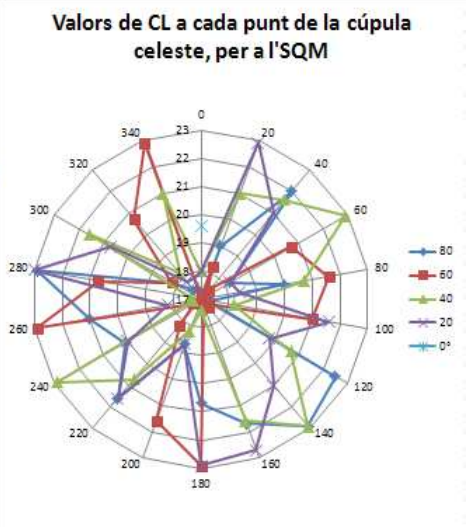


Fig. N.7 – Pas 1 per a l'SQM-LU

La resta de passos són exactament iguals que per a l'SQM normal.

N.3. Resultat visible a l'arxiu KML

El resultat general a l'arxiu KML és un llistat de punts, cada un amb totes les dades introduïdes a l'arxiu excel. Es presenten unes imatges aclaridores a continuació.

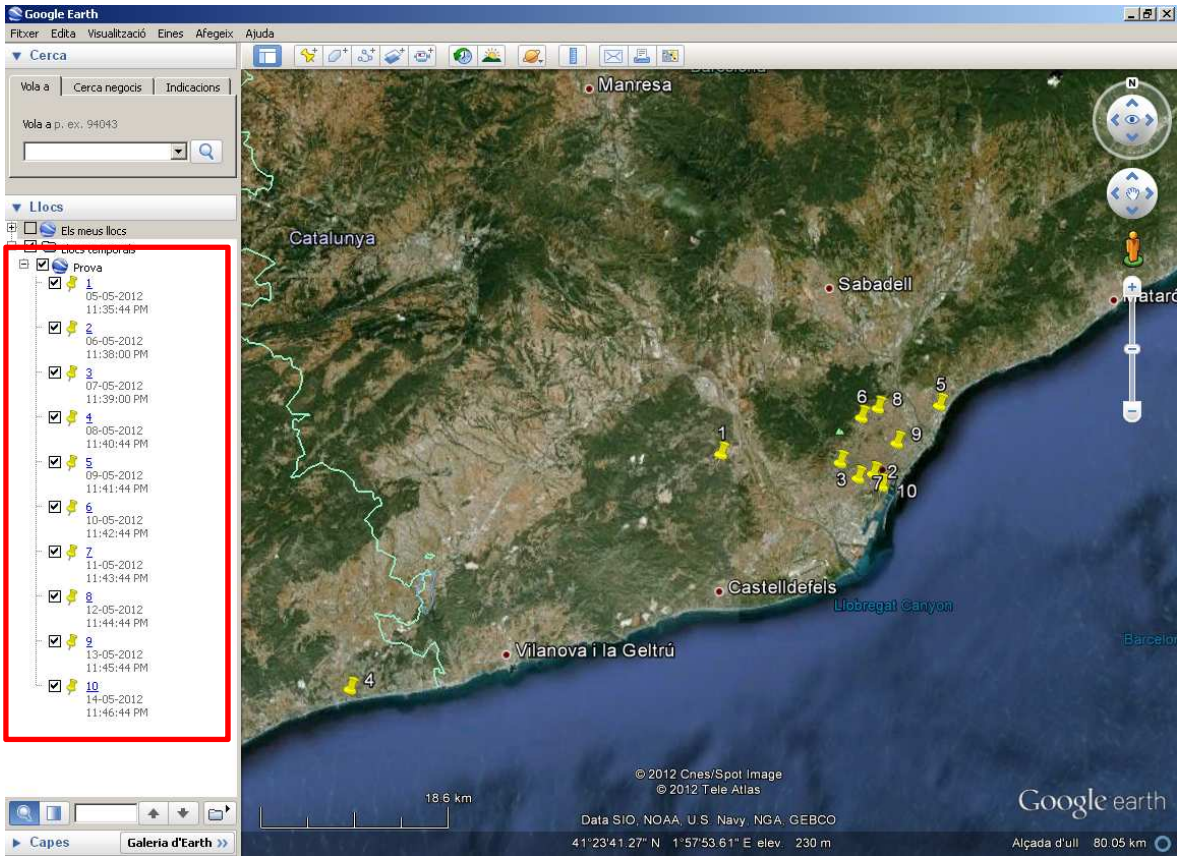


Fig. N.8 – Captura d'imatge de l'arxiu KML generat, obert amb el programa Google Earth

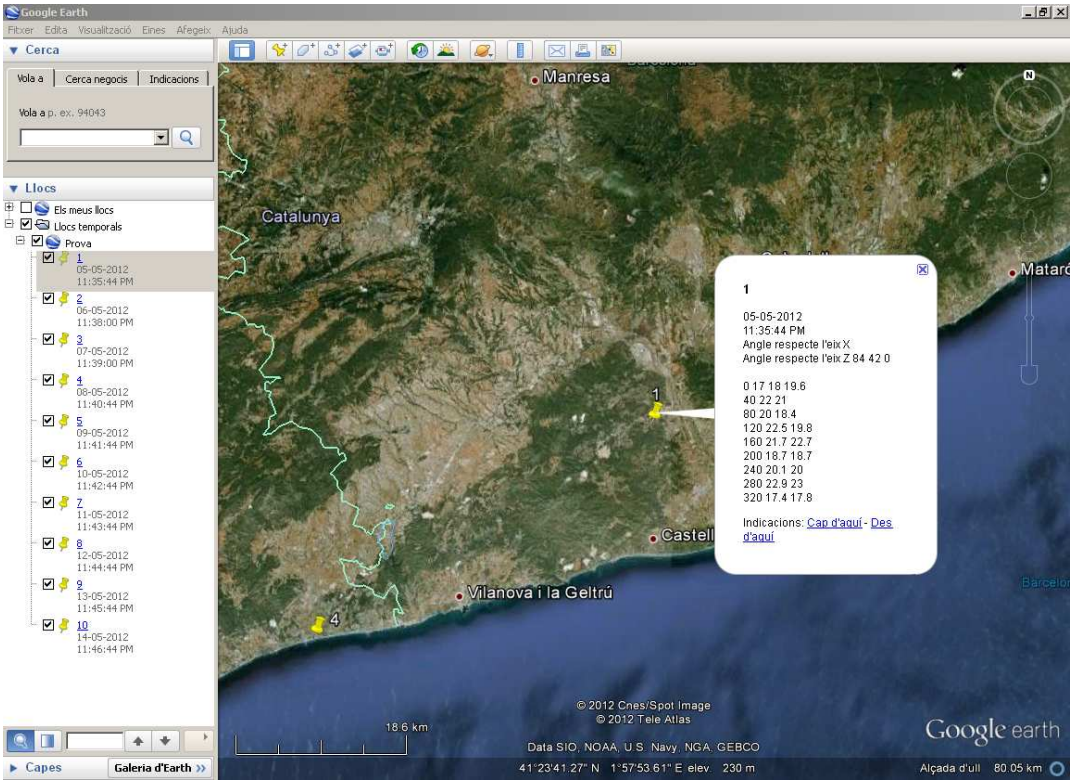


Fig. N.9 – Propietats ràpides en polsar el punt 1 per a l'SQM normal

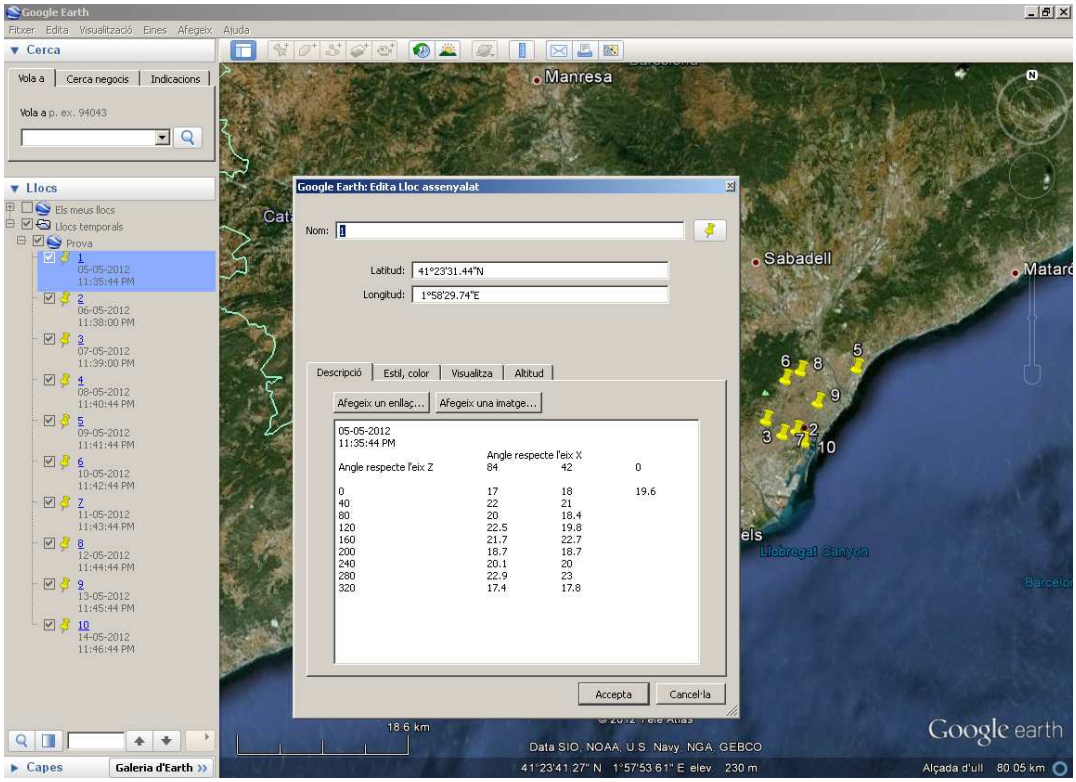


Fig. N.10 – Propietats ampliades del punt 1 per a l'SQM normal

ETSEIB

N.4. Codi de programació implementat de la macro emprada

El llenguatge de programació emprat per dissenyar la macro és Visual Basic. El codi de programació emprat s'adjunta a continuació:

```
Sub generateKML()

'

' GenerateKML Macro

' Macro recorded 26/09/2006 by simon_a

' Implemented by A.Sancho 06/05/2012


    ' Set file details

    Set filePath = [PAS_3!C2]


    ' Set document name

    Set docName = [PAS_3!C3]


    Open filePath For Output As #1


    'Write header to file

    outputText = [PAS_3!C5] & docName & [PAS_3!C6]

    Print #1, outputText


    'Start to loop through stations

    For Each cell In [PAS_2!A2.A50001]
```

```
        pmName = cell.Offset(0, 0)
        longitudeValue = cell.Offset(0, 1)
        latitudeValue = cell.Offset(0, 2)
        pmDescription = cell.Offset(0, 3)

        If pmName = "" Then
          Exit For
        End If

        'Create a placemark
        outputText = [PAS_3!C8] & pmName & [PAS_3!C9] & longitudeValue & ", " & latitudeValue & [PAS_3!C10] & pmDescription & [PAS_3!C11]
        Print #1, outputText

    Next

   'Write footer to file
    outputText = [PAS_3!C13]
    Print #1, outputText

    Close #1
    '
End Sub
```

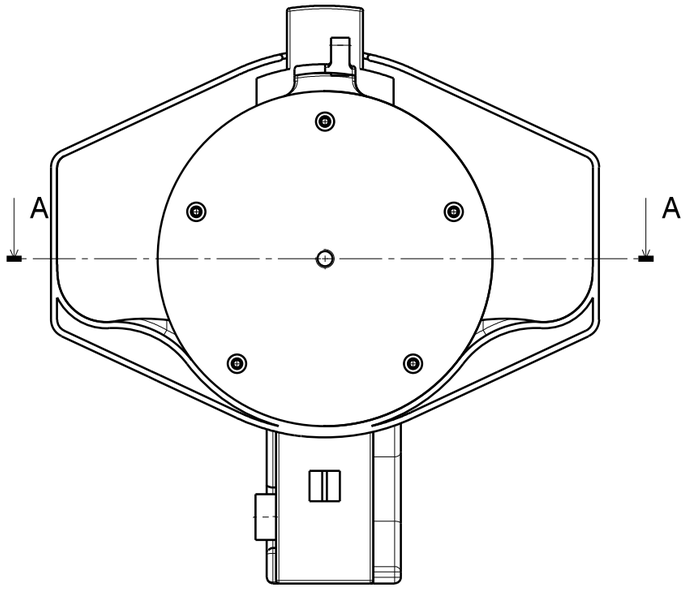
O. PLÀNOLS

A continuació es presenten tots els plànols pertinents al projecte. En alguns casos són modificacions sobre els elements comercials, i en d'altres són elements creats des de zero.

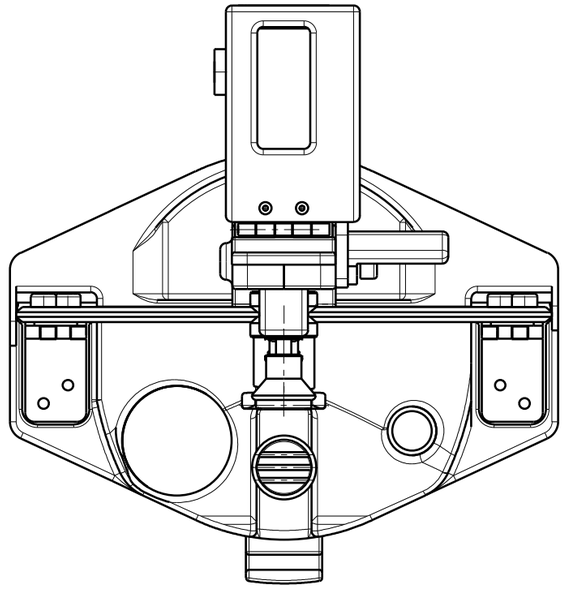
Si són una modificació d'un element comercial, duran la nota REF.

En cas de que hi hagi una operació que sigui recurrent a la peça, es marcarà amb la nota "TYP", abreviació de la paraula anglesa "typological".

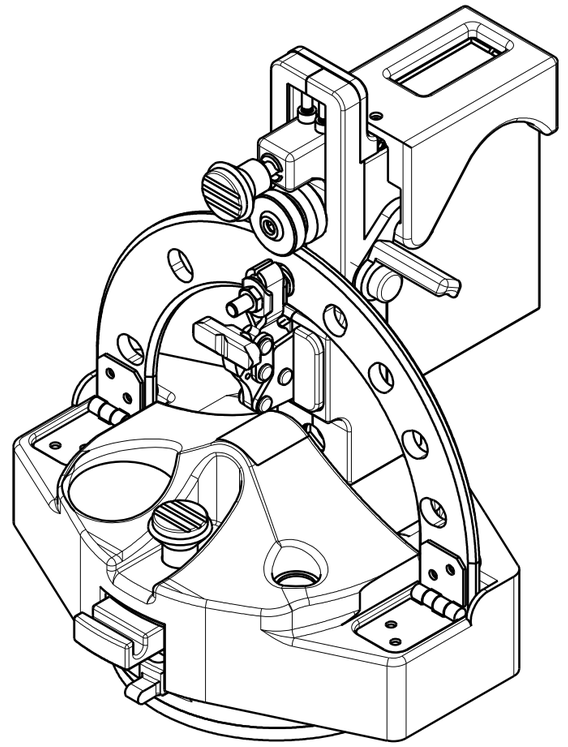
En cas de que hi hagi més d'una operació igual a la peça, i sigui una operació molt concreta (taladrats, dentats, etc.) es marcarà amb la nota "SIT", abreviació de la paraula anglesa "site", que vol dir emplaçament.



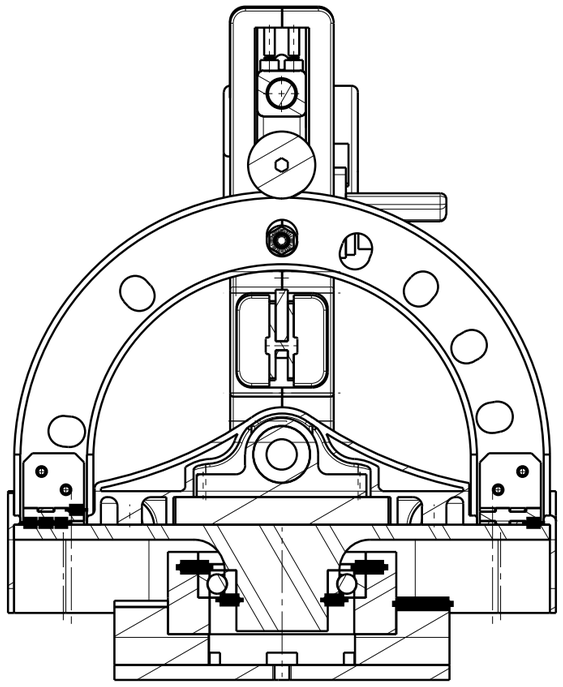
Rear view
Scale: 1:2



Front view
Scale: 1:2



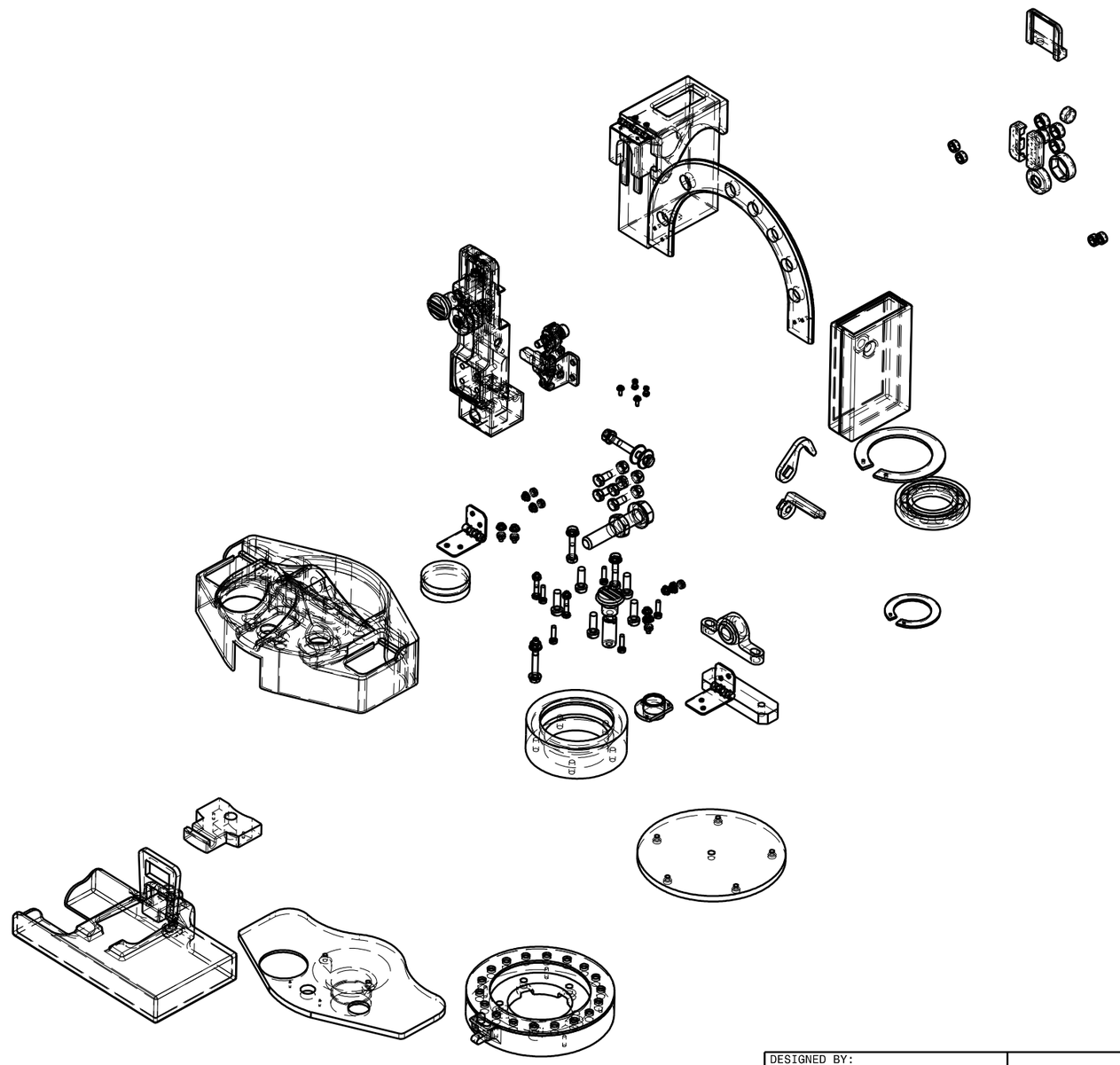
Isometric view
Scale: 1:2



Section view A-A
Scale: 1:2

DESIGNED BY: A.Sancho DATE: 04/03/2012		SDNC Conjunt General	
SIZE A3		Sky Dome Night Characterizer	
SCALE 1:1	WEIGHT (kg) 2,3	DRAWING NUMBER 1	SHEET 1/2

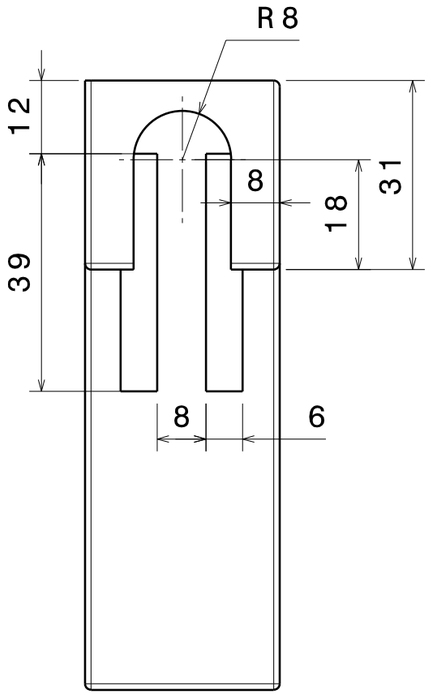
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



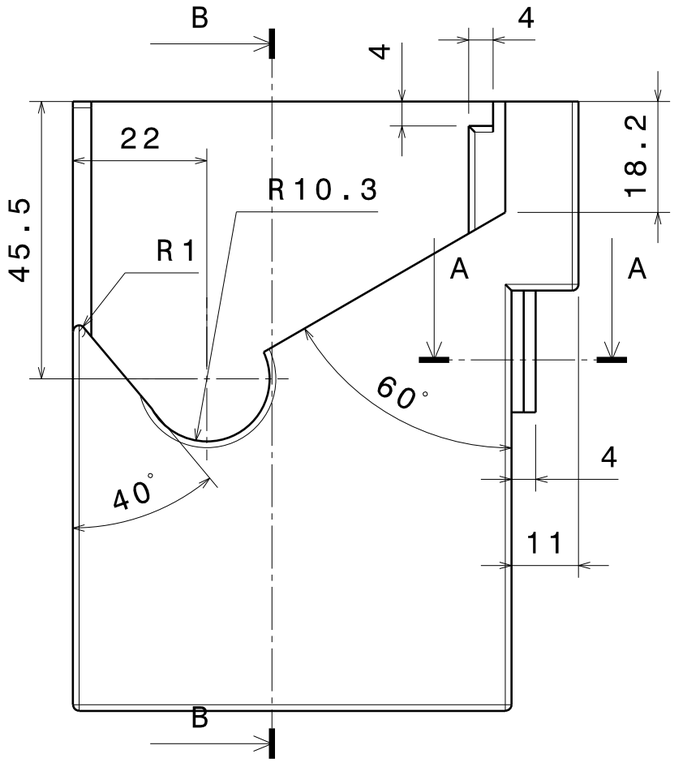
Isometric view
Scale: 1:4

DESIGNED BY: A.Sancho		SDNC Conjunt General	
DATE: 04/03/2012			
SIZE A3		Sky Dome Night Characterizer	
SCALE 1:1	WEIGHT (kg) 2,3	DRAWING NUMBER 2	SHEET 2/2

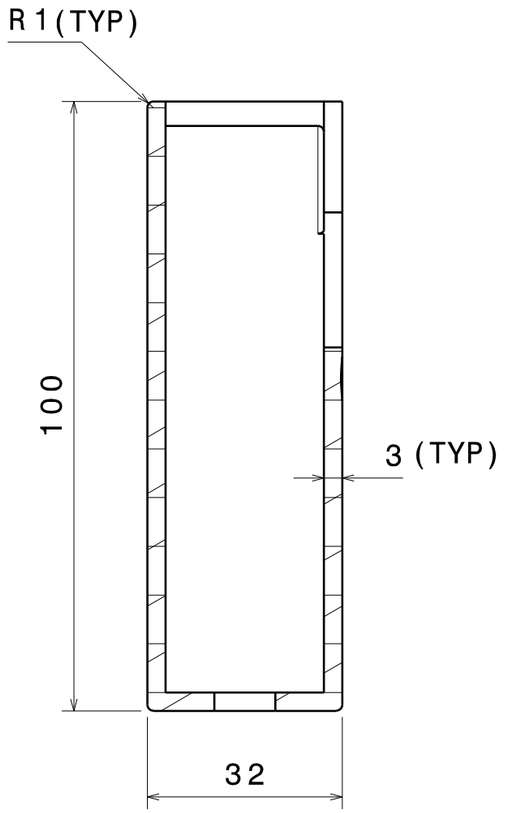
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



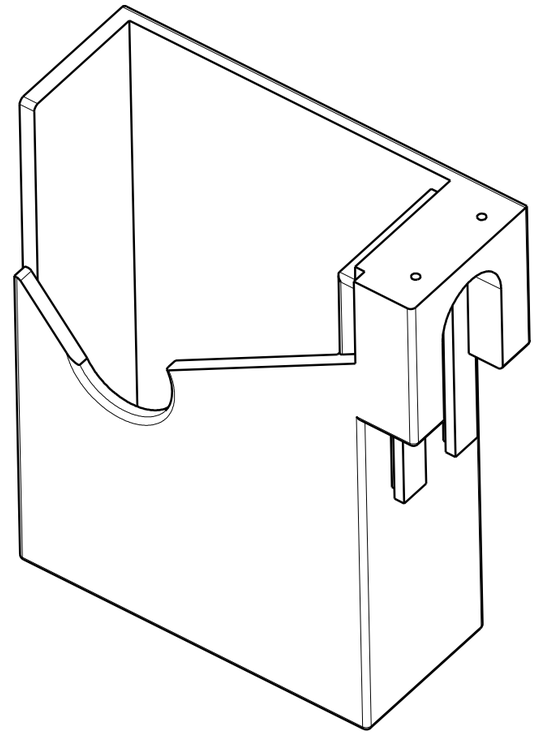
Right view
Scale: 1:1



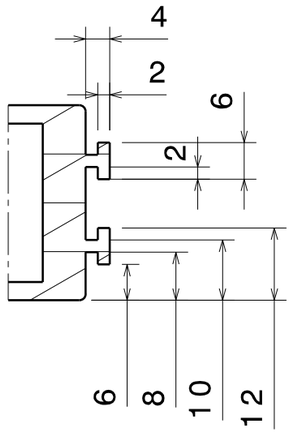
Front view
Scale: 1:1



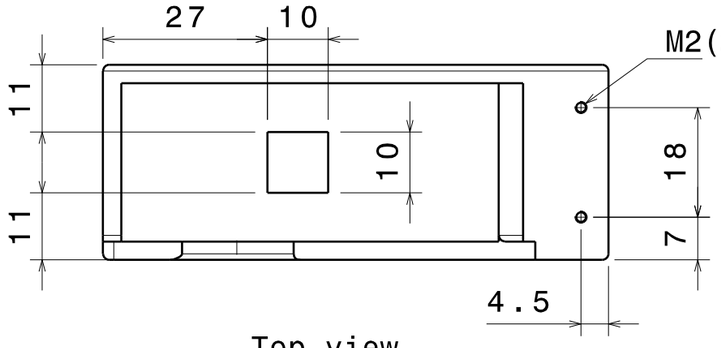
Section view B-B
Scale: 1:1



Isometric view
Scale: 1:1



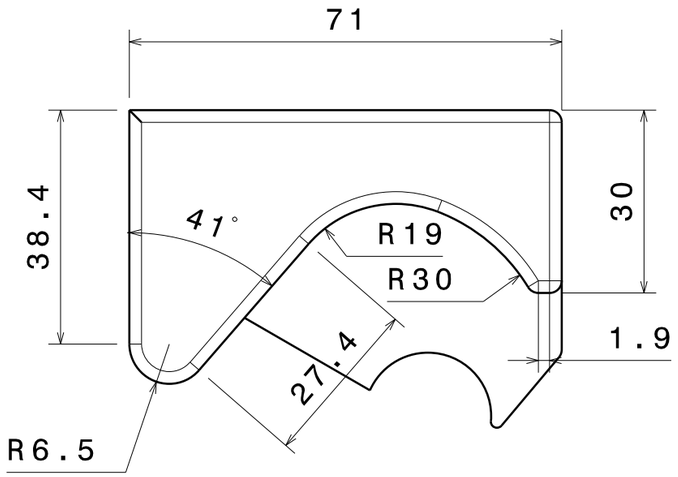
Section view A-A
Scale: 1:1



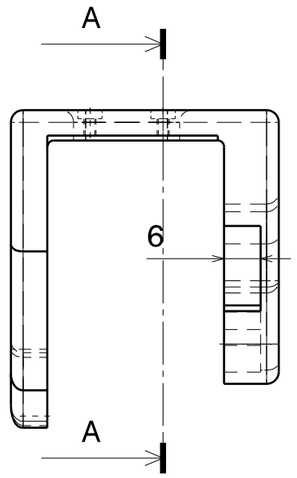
Top view
Scale: 1:1

DESIGNED BY: A.Sancho DATE: 01/03/2012		Caixa	
SIZE: A3		Sky Dome Night Characterizer	
SCALE: 1:1	WEIGHT (kg): 0,087	DRAWING NUMBER: 3	SHEET: 1/1

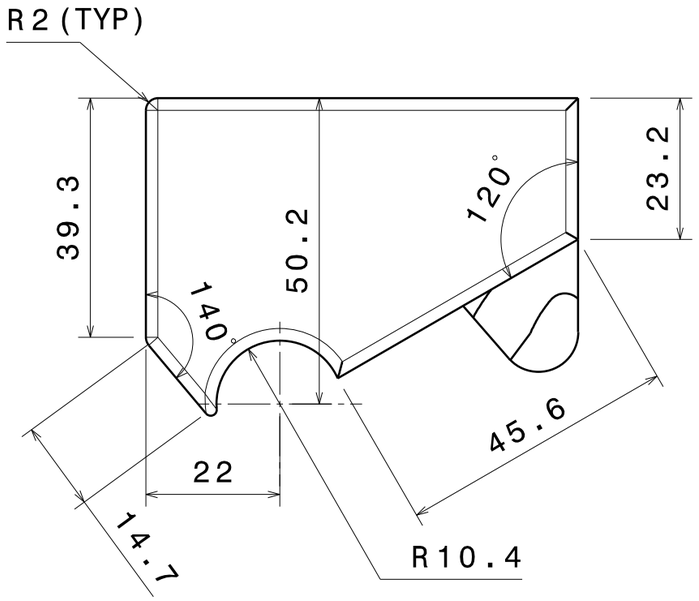
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



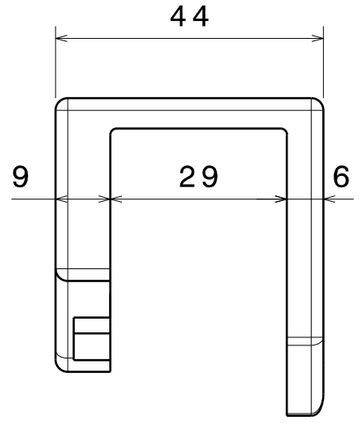
Rear view
Scale: 1:1



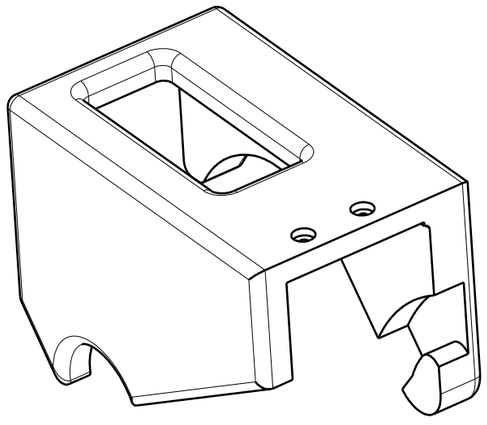
Right view
Scale: 1:1



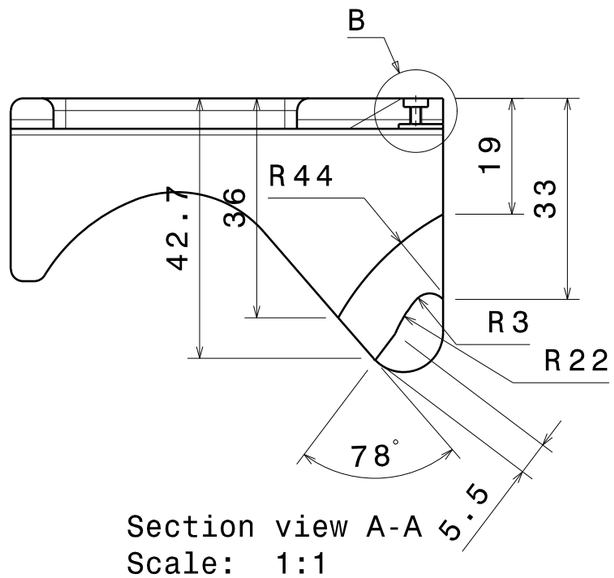
Front view
Scale: 1:1



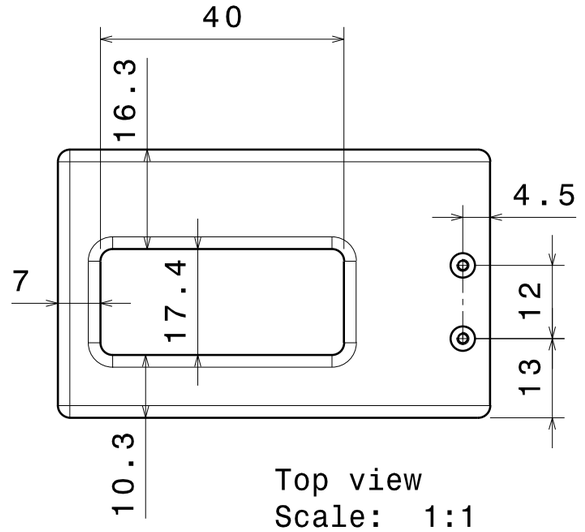
Left view
Scale: 1:1



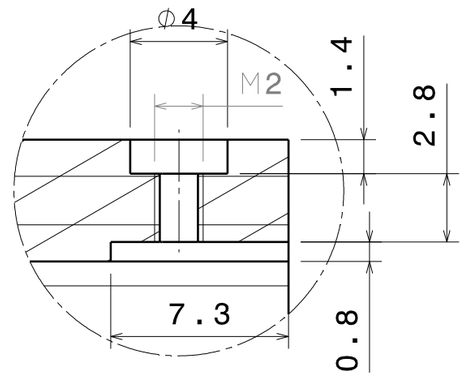
Isometric view
Scale: 1:1



Section view A-A
Scale: 1:1



Top view
Scale: 1:1



Detail B
Scale: 4:1

DESIGNED BY: A.Sancho
DATE: 03/03/2012

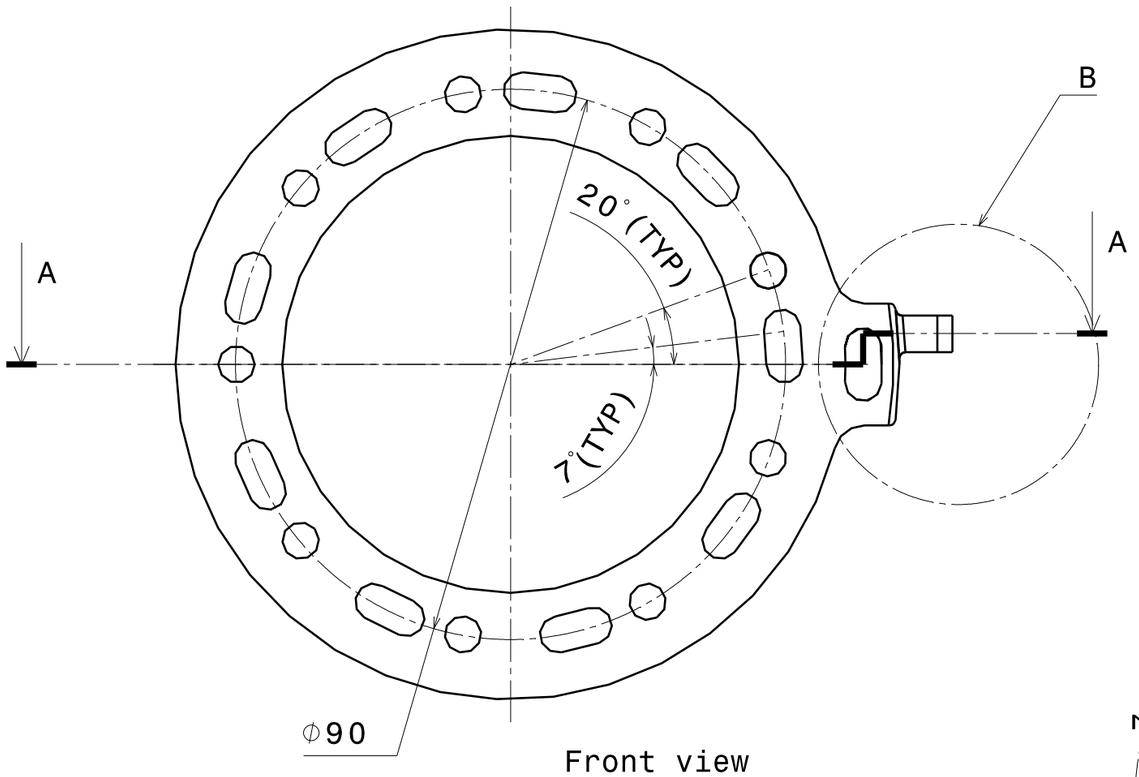
UPC ETSEIB

Tapa de Caixa

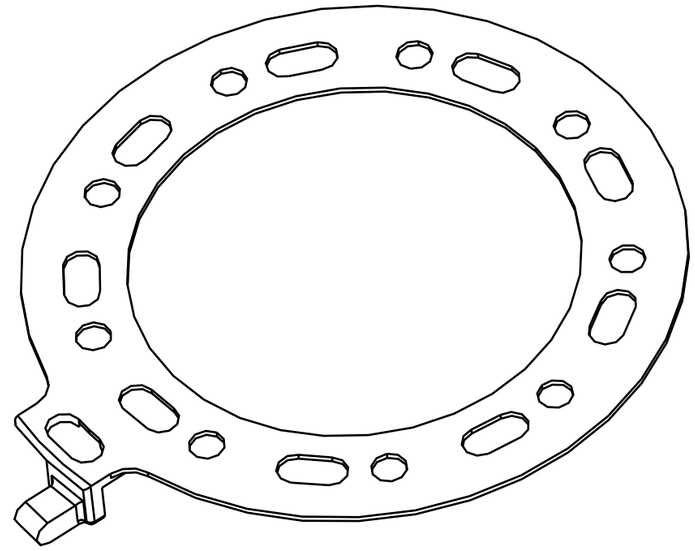
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,046	4	1/1

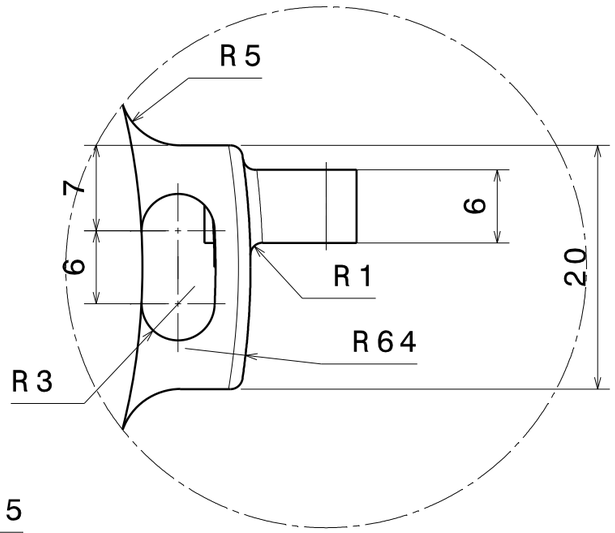
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



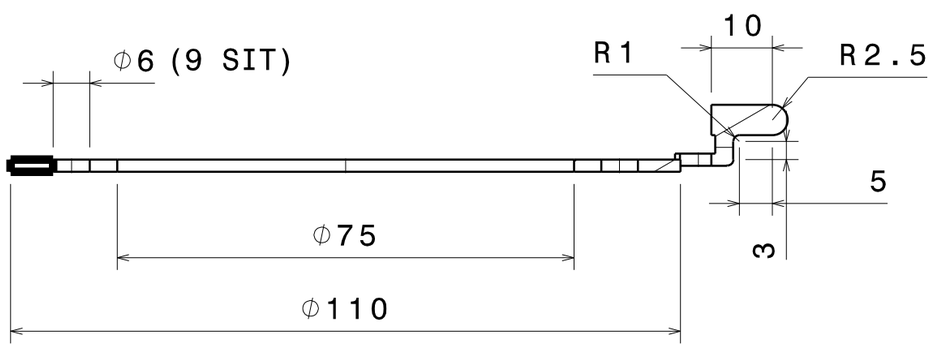
Front view
Scale: 1:1



Isometric view
Scale: 1:1



Detail view B
Scale: 2:1



Section view A-A
Scale: 1:1

DESIGNED BY: A.Sancho
DATE: 03/03/2012

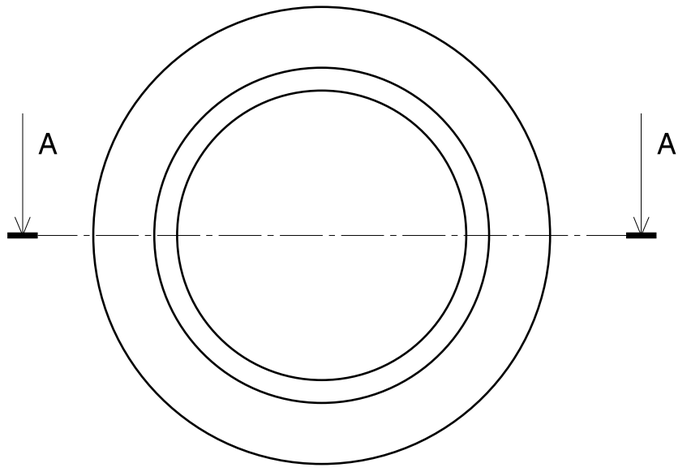
UPC ETSEIB

Disc de cobertura

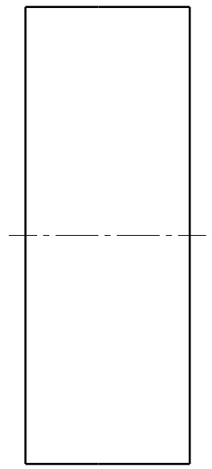
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,012	5	1/1

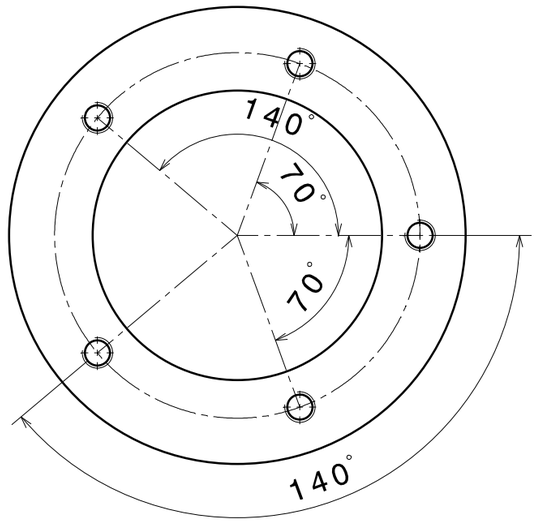
I	–
H	–
G	–
F	–
E	–
D	–
C	–
B	–
A	–



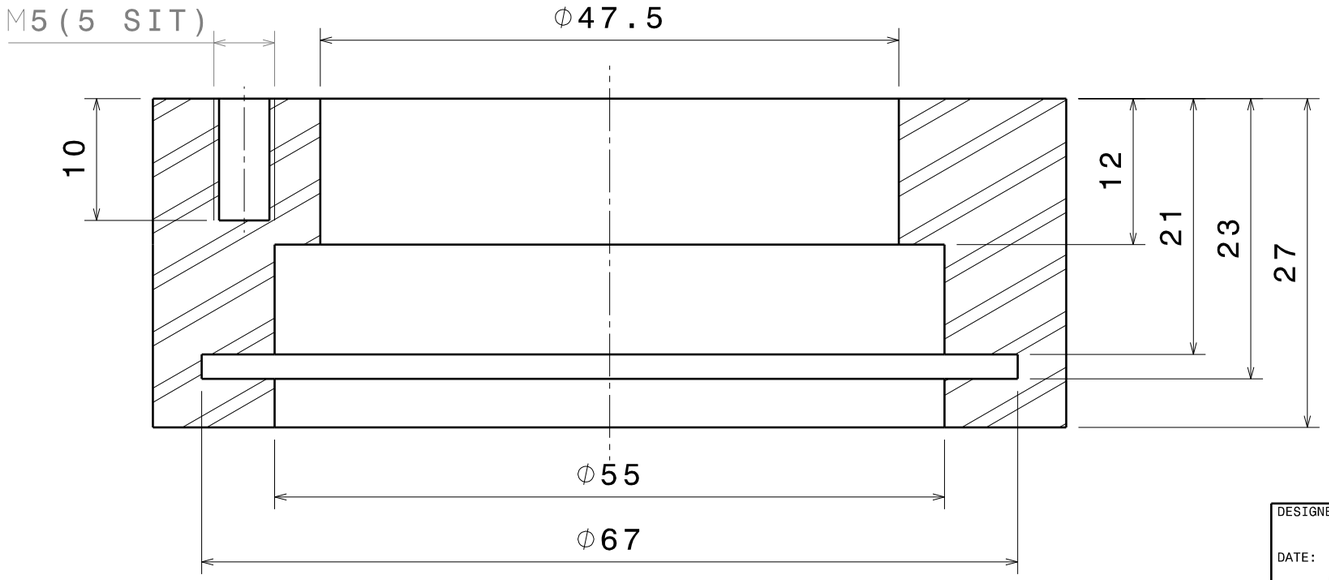
Front view
Scale: 1:1



Left view
Scale: 1:1



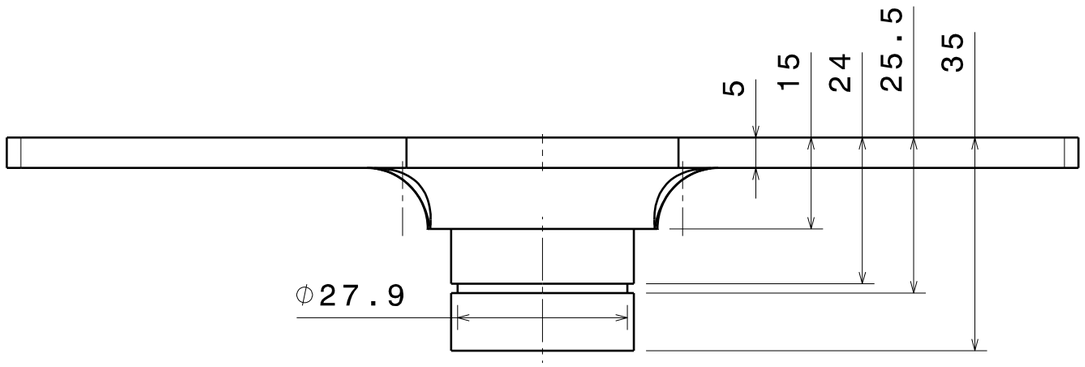
Rear view
Scale: 1:1



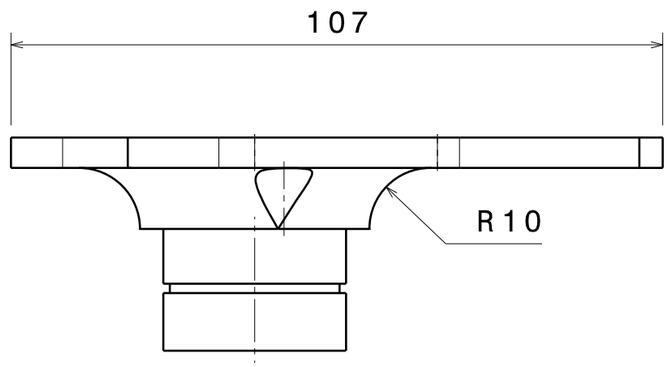
Section view A-A
Scale: 2:1

DESIGNED BY: A.Sancho DATE: 03/03/2012		Disc Inferior	
SIZE A3		Sky Dome Night Characterizer	
SCALE 1:1	WEIGHT (kg) 0,161	DRAWING NUMBER 6	SHEET 1/1

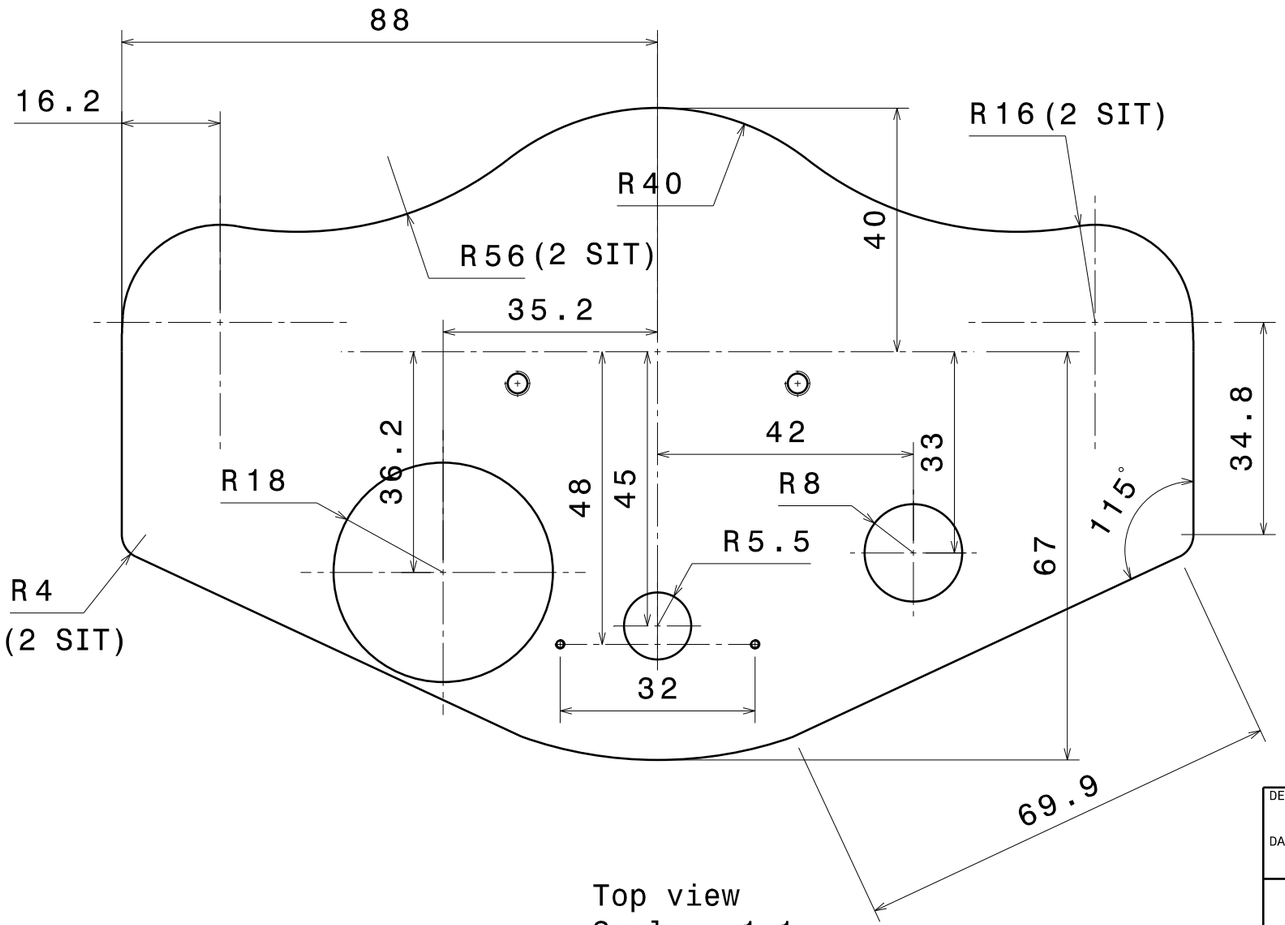
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



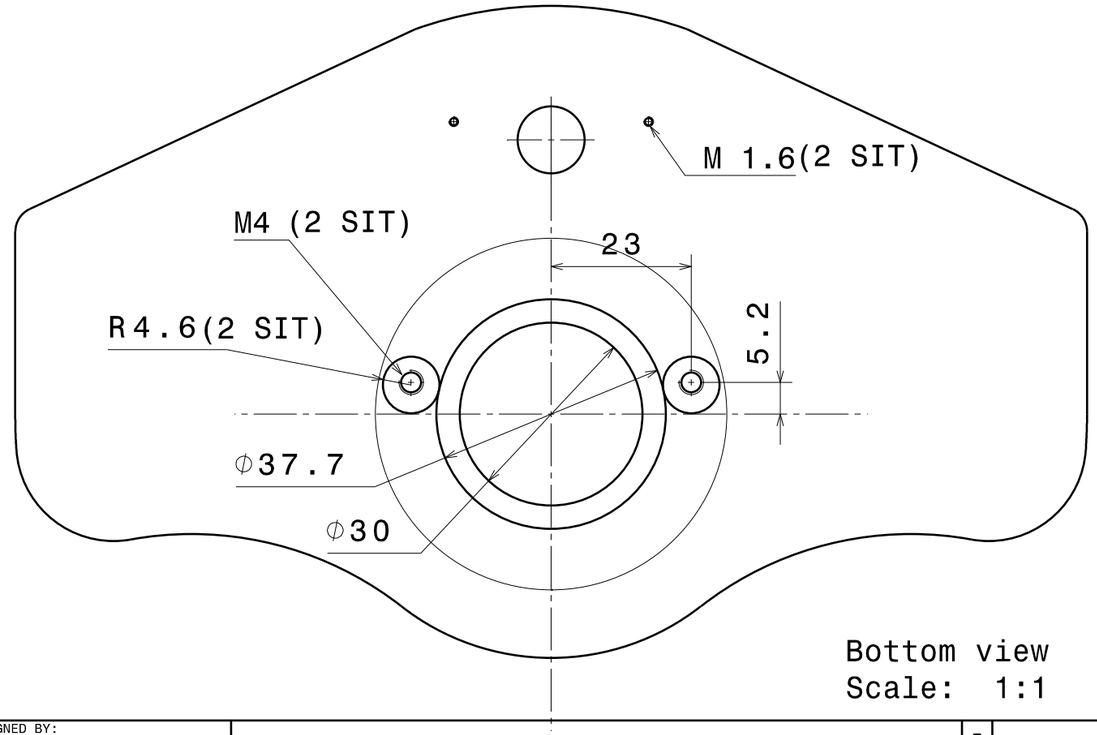
Front view
Scale: 1:1



Left view
Scale: 1:1



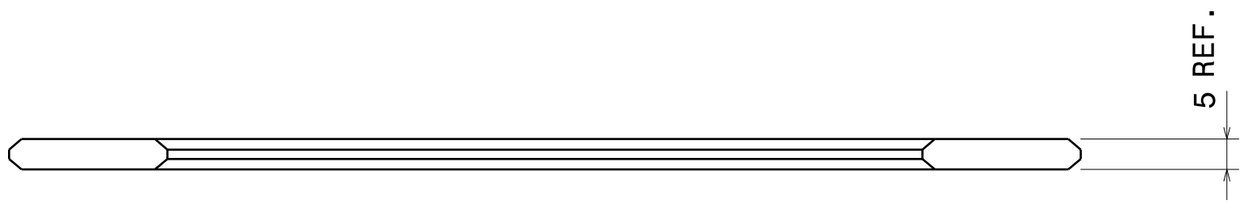
Top view
Scale: 1:1



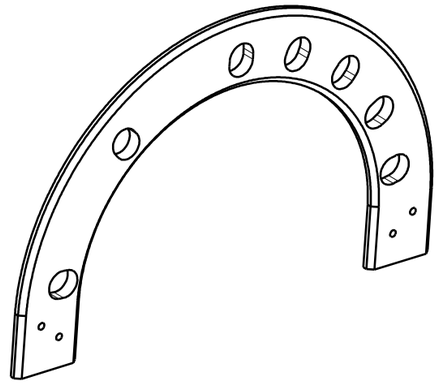
Bottom view
Scale: 1:1

DESIGNED BY: A.Sancho DATE: 03/03/2012 UPC ETSEIB		Disc Superior	
SIZE A3		Sky Dome Night Characterizer	
SCALE 1:1	WEIGHT (kg) 0,253	DRAWING NUMBER 7	SHEET 1/1

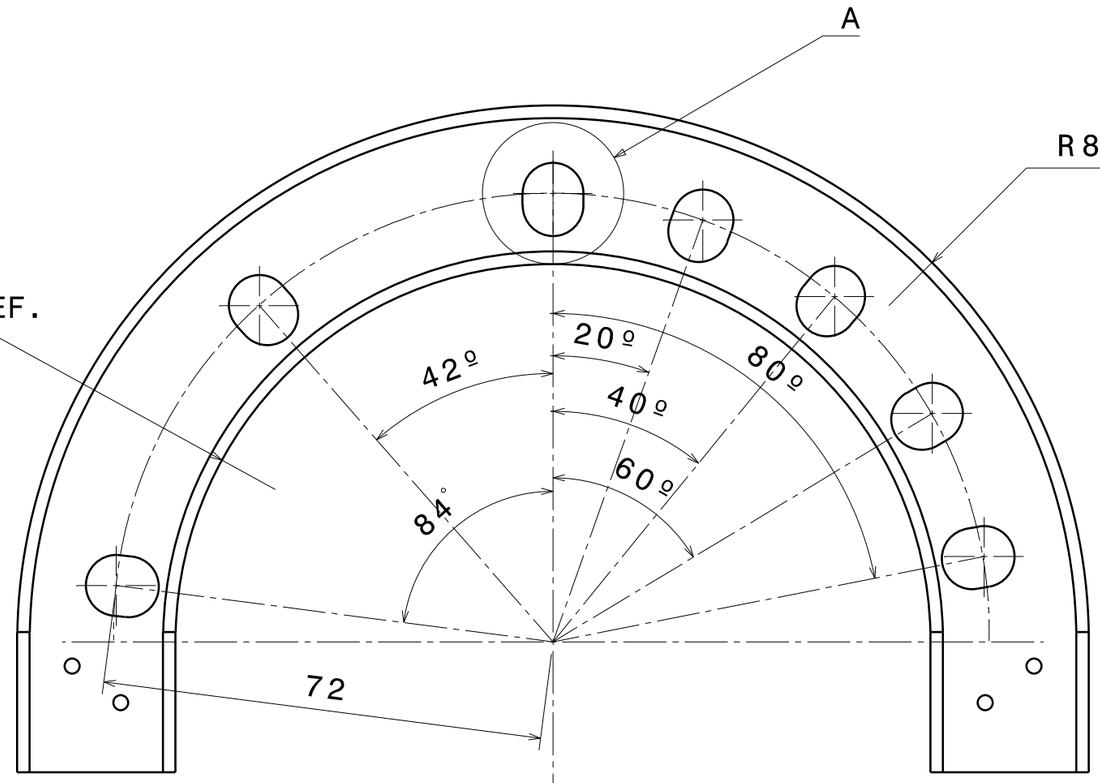
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



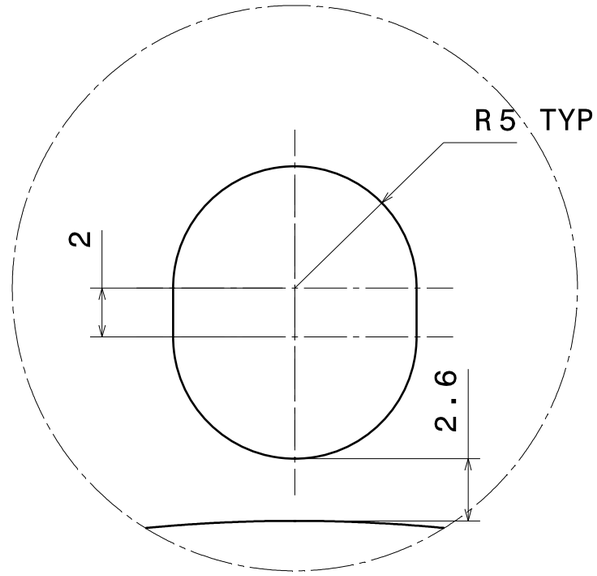
Bottom view
Scale: 1:1



Isometric view
Scale: 1:2



Front view
Scale: 1:1



Detail A
Scale: 4:1

DESIGNED BY: A.Sancho
DATE: 27/02/2012

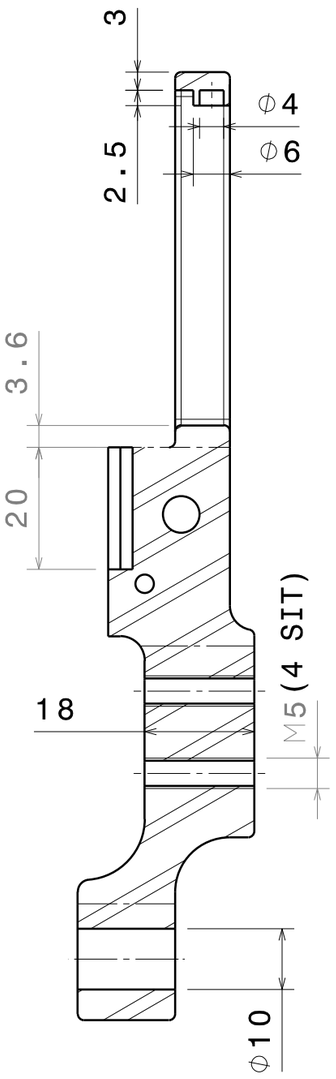
UPC ETSEIB

Guia Nadella

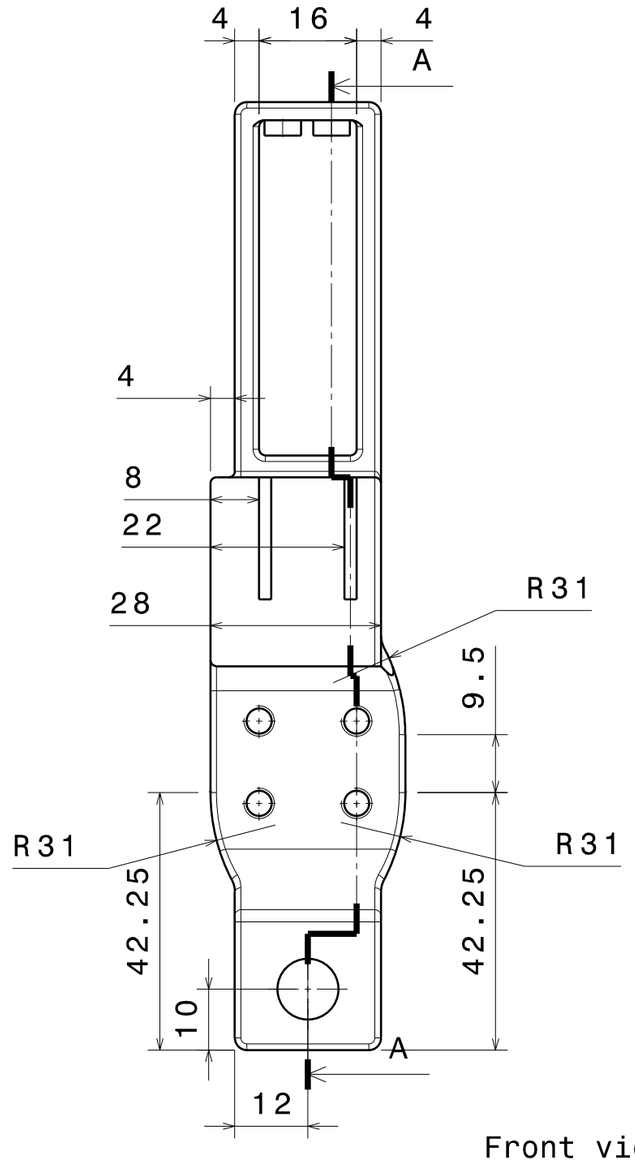
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,083	8	1/1

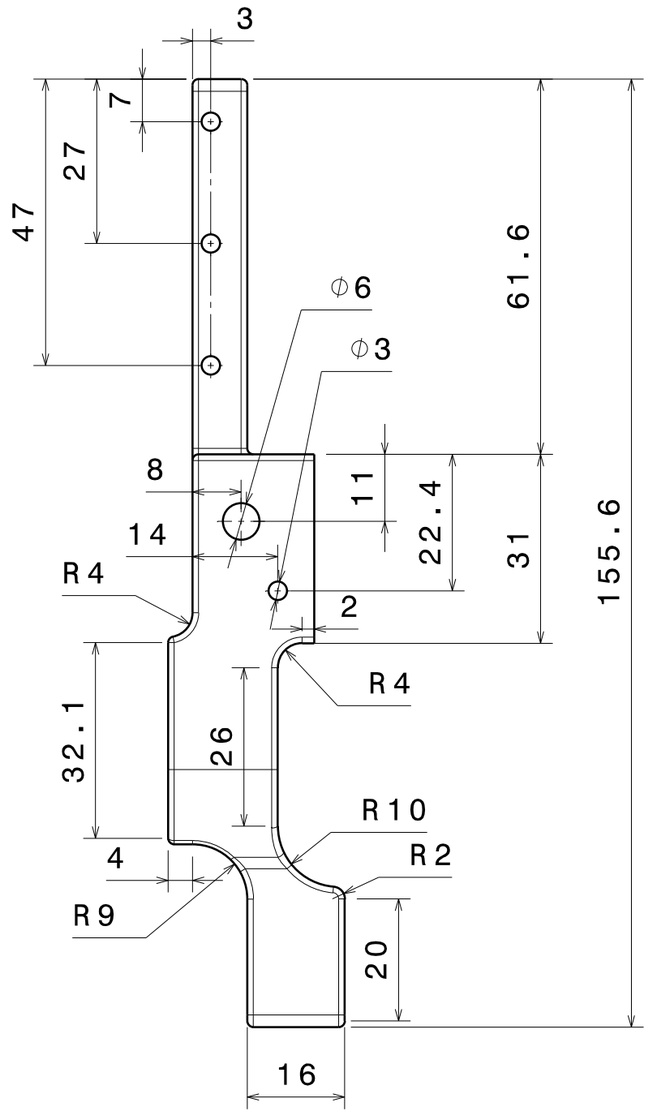
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



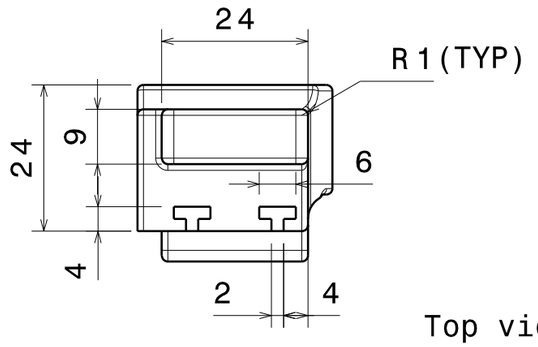
Section view A-A
Scale: 1:1



Front view
Scale: 1:1



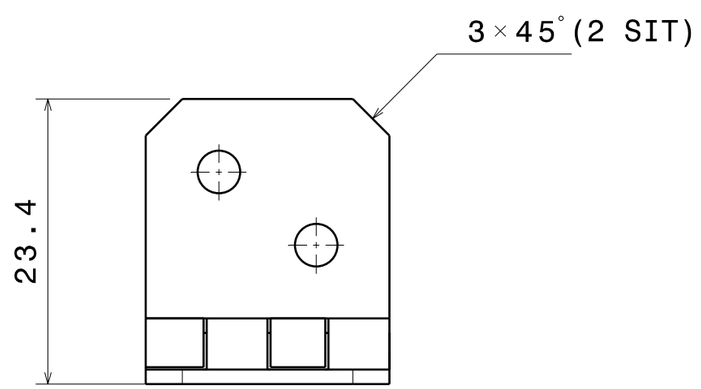
Left view
Scale: 1:1



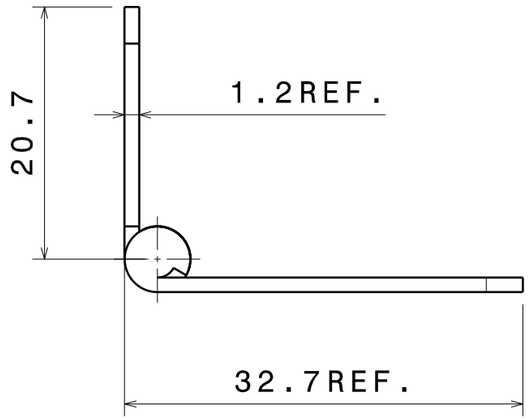
Top view
Scale: 1:1

DESIGNED BY: A.Sancho	Mobile block
DATE: 28/02/2012	
SIZE: A3	Sky Dome Night Characterizer
SCALE: 1:1 / WEIGHT (kg): 0,131 / DRAWING NUMBER: 9 / SHEET: 1/1	

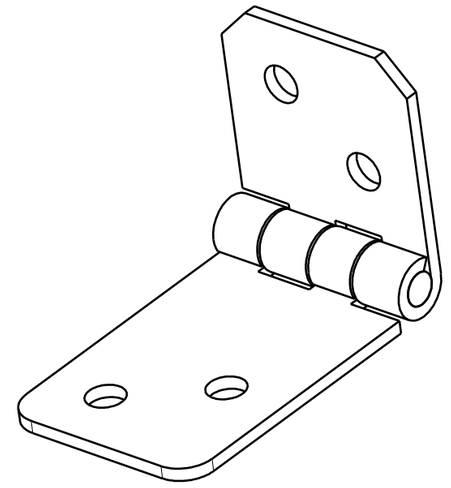
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



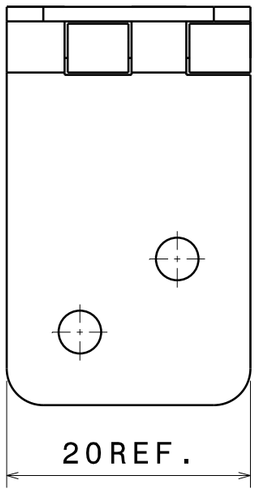
Front view
Scale: 2:1



Left view
Scale: 2:1



Isometric view
Scale: 2:1

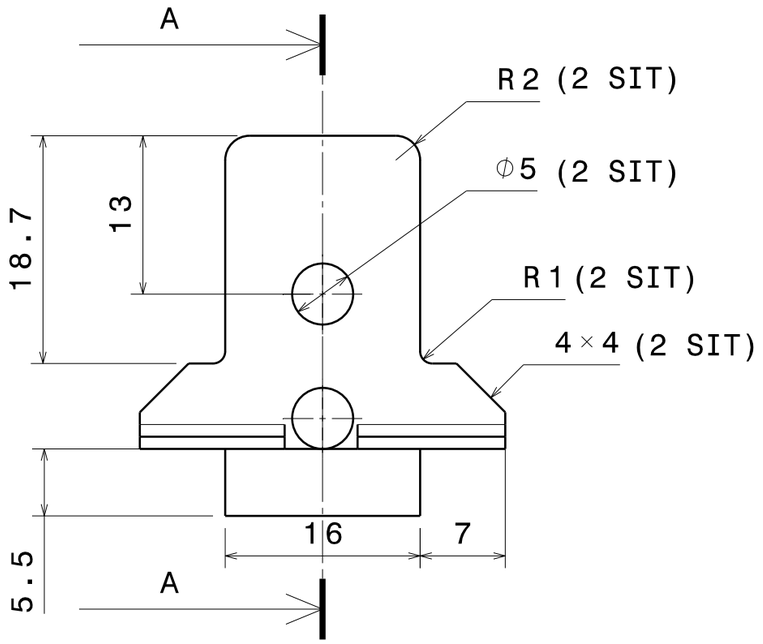


Top view
Scale: 2:1

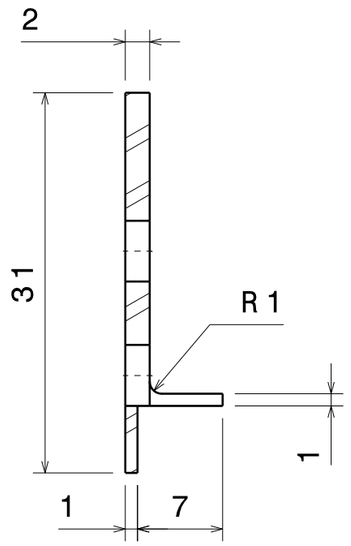
NOTA:

Les modificacions sobre el comercial inicial estan assenyalades sense la nota REF.
REF.: Mides estàndar del producte

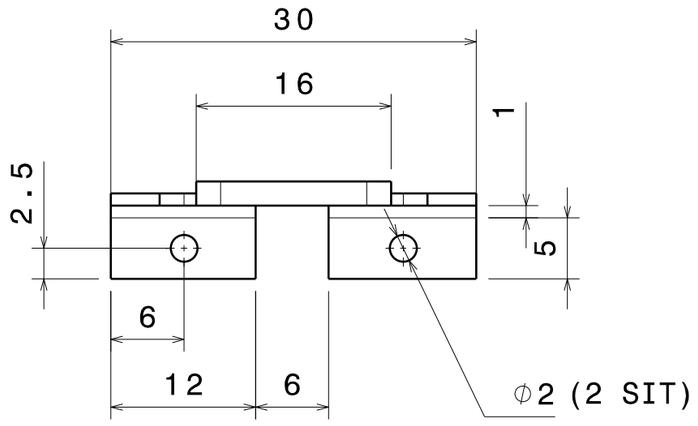
DESIGNED BY: A.Sancho DATE: 01/03/2012		Modificació Junta PINET	I –
			H –
			G –
			F –
SIZE A3		Sky Dome Night Characterizer	E –
			D –
			C –
SCALE 1:1	WEIGHT (kg) 0,013	DRAWING NUMBER 10 / SHEET 1/1	B –
			A –



Front view
Scale: 2:1



Section view A-A
Scale: 2:1



Top view
Scale: 2:1

DESIGNED BY: A.Sancho
DATE: 28/02/2012

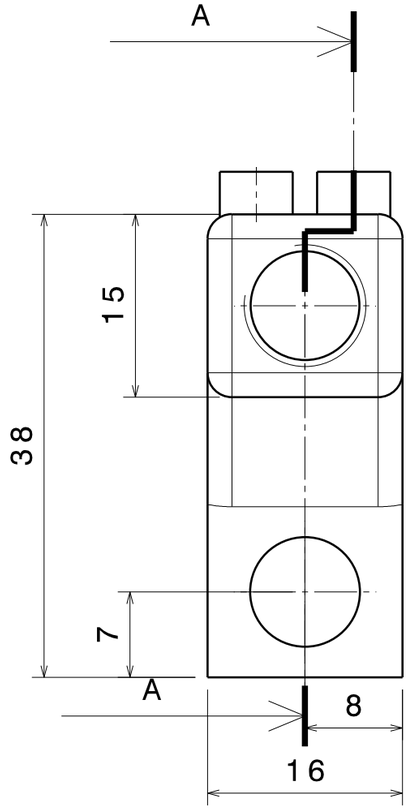
UPC ETSEIB

Placa 2 taladros

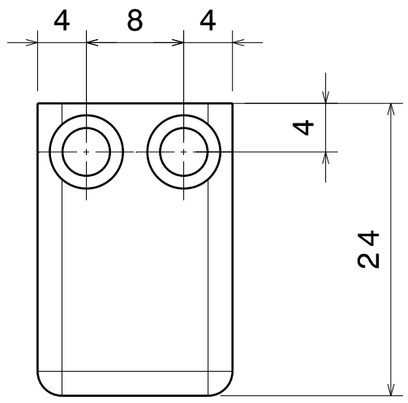
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,003	11	1/1

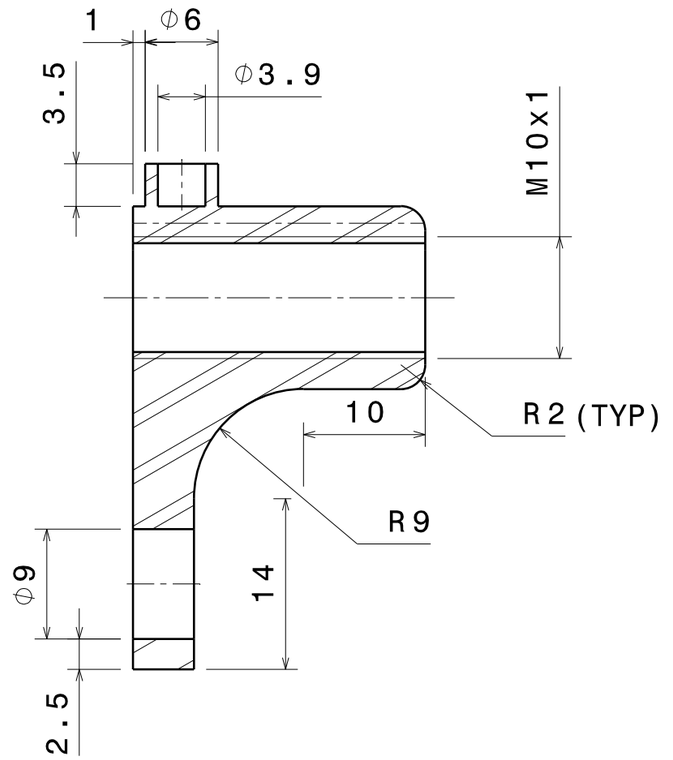
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



Front view
Scale: 2:1

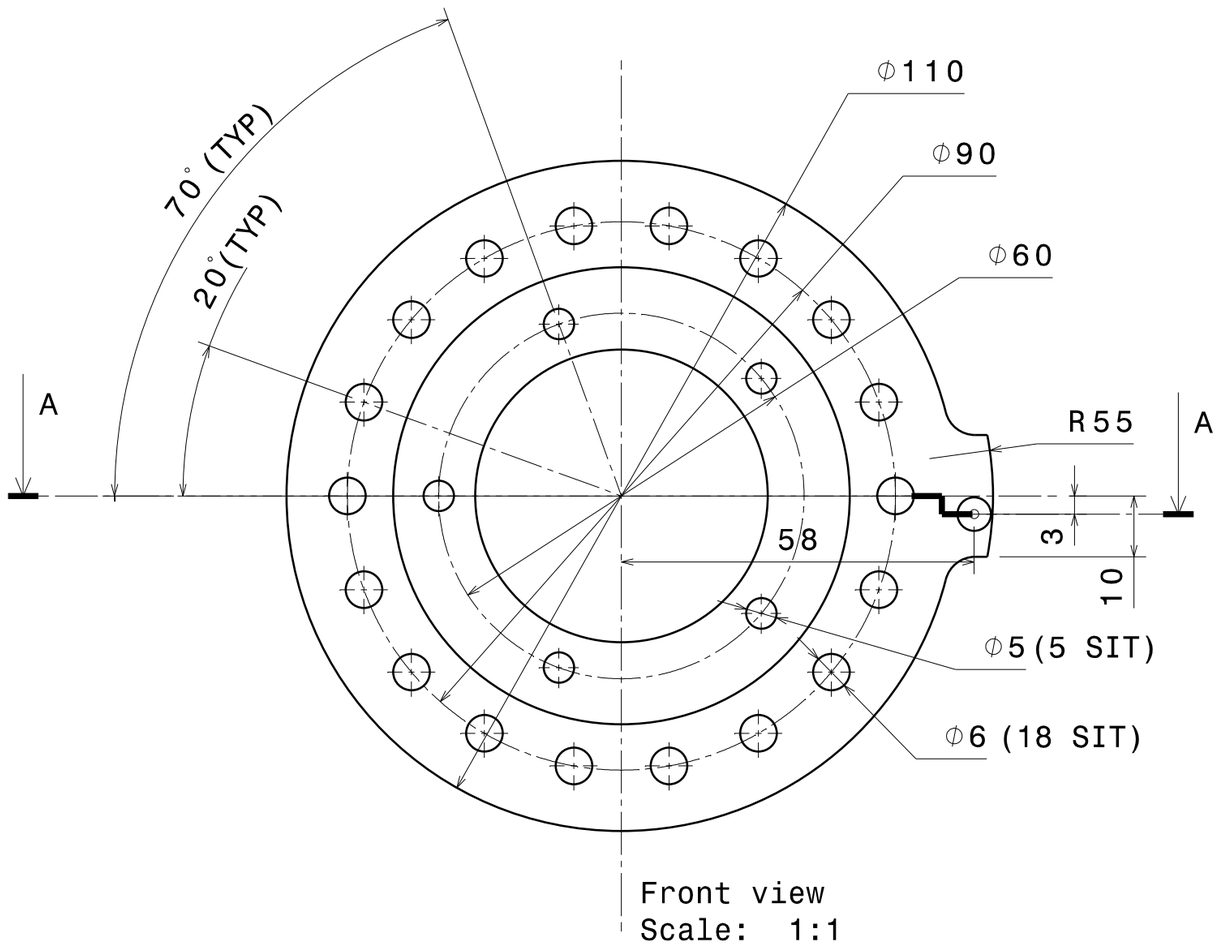


Top view
Scale: 2:1

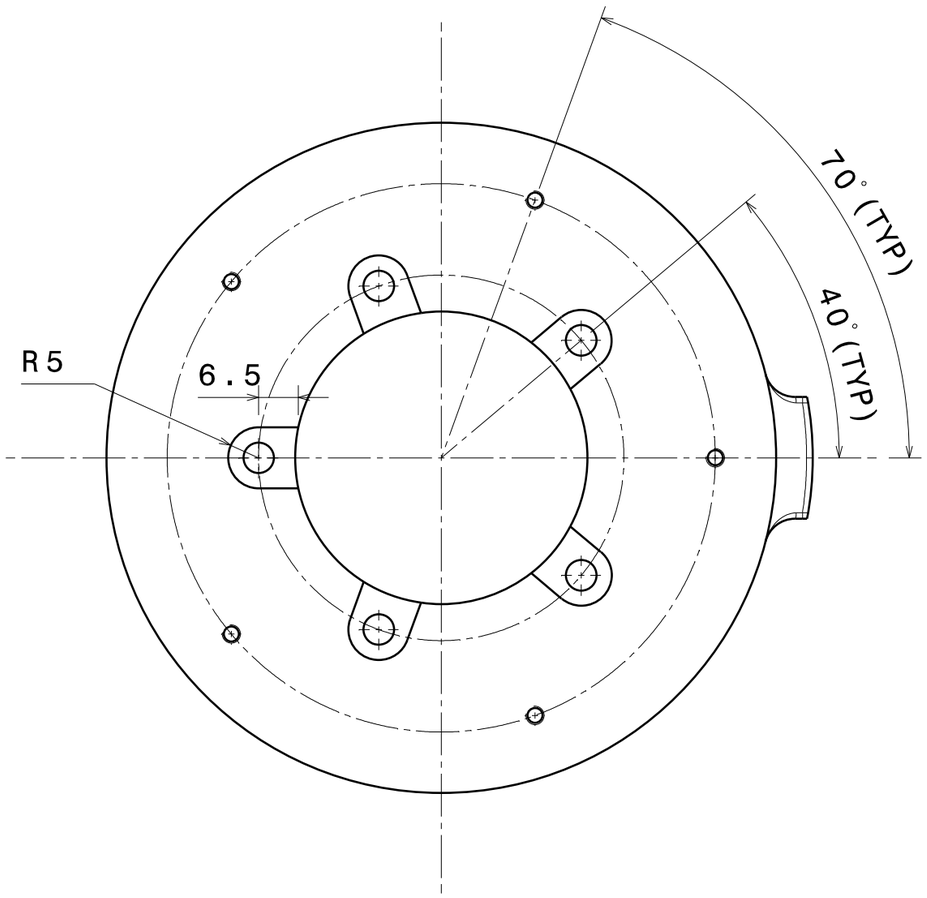


Section view A-A
Scale: 2:1

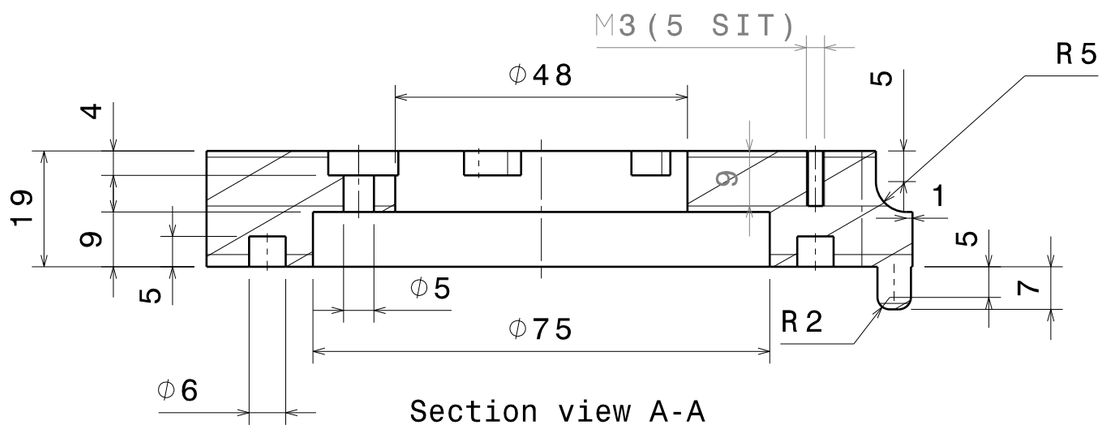
DESIGNED BY: A.Sancho DATE: 28/02/2012		Placa de molla		I _
				H _
				G _
				F _
SIZE A3		Sky Dome Night Characterizer		E _
				D _
				C _
SCALE 1:1	WEIGHT (kg) 0,017	DRAWING NUMBER 12	SHEET 1/1	B _
				A _



Front view
Scale: 1:1



Front view
Scale: 1:1



Section view A-A
Scale: 1:1

DESIGNED BY: A.Sancho
DATE: 03/03/2012

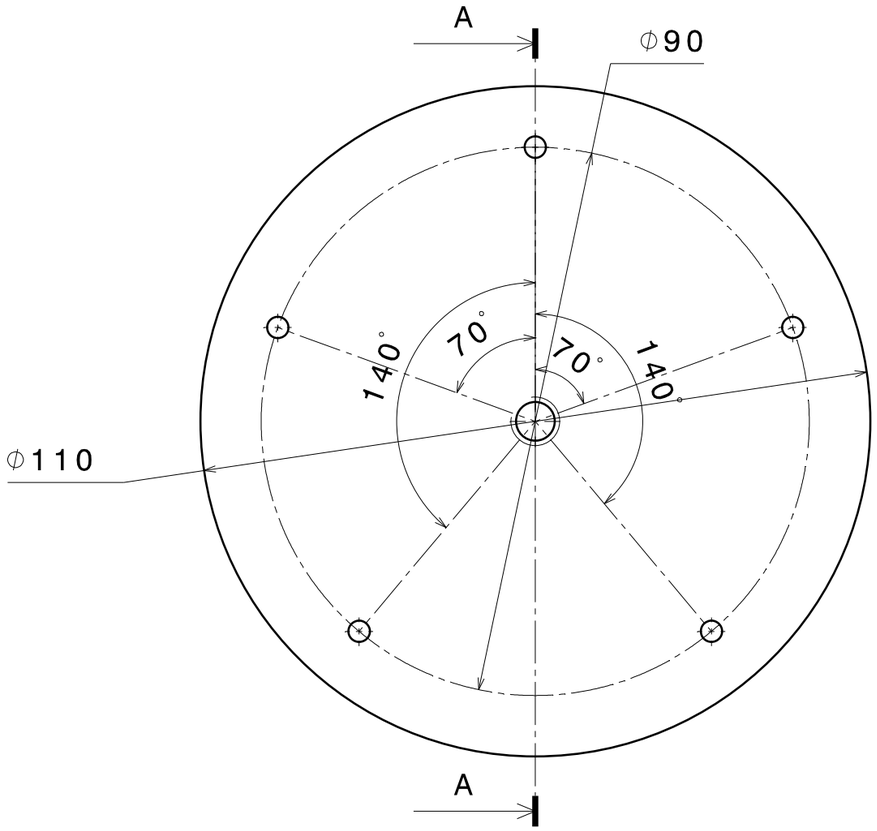
UPC ETSEIB

Placa de subjecció

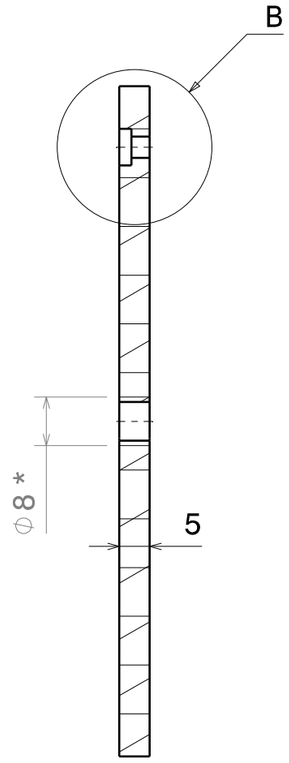
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,142	13	1/1

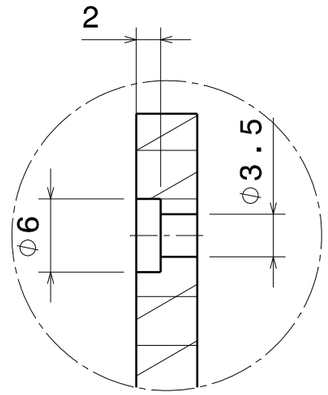
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



Front view
Scale: 1:1



Section view A-A
Scale: 1:1

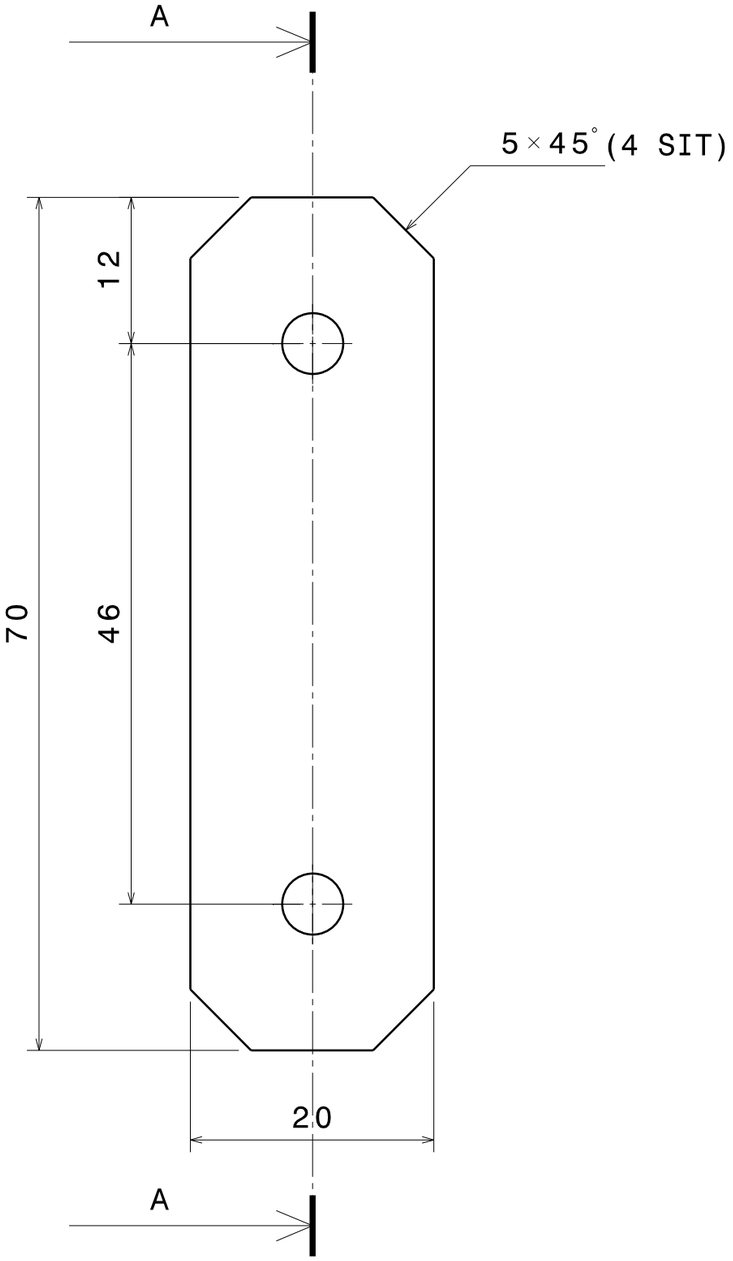


Detail B
Scale: 2:1

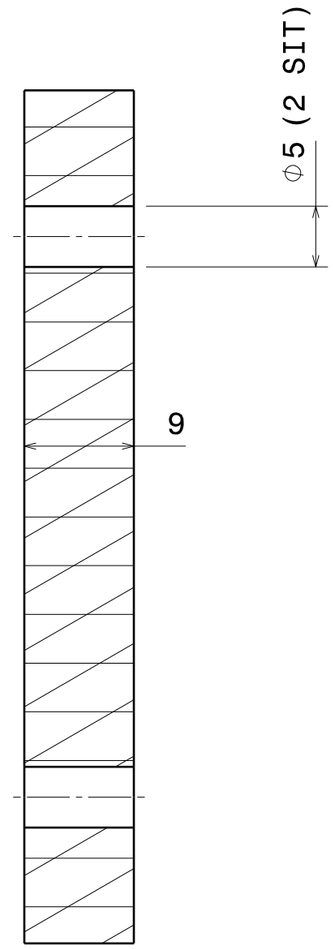
NOTA:
Aquesta dimensió depèn del tripode al que es vulgui acoblar. Segons el model proposat, aquesta dimensió és 1/4'' (en rosca americana)

DESIGNED BY: A.Sancho DATE: 03/03/2012 UPC ETSEIB		Placa inferior	
SIZE A3		Sky Dome Night Characterizer	
SCALE 1:1	WEIGHT (kg) 0,056	DRAWING NUMBER 14	SHEET 1/1

I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_

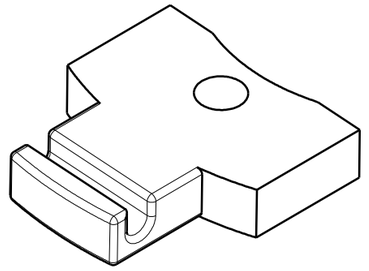


Front view
Scale: 2:1

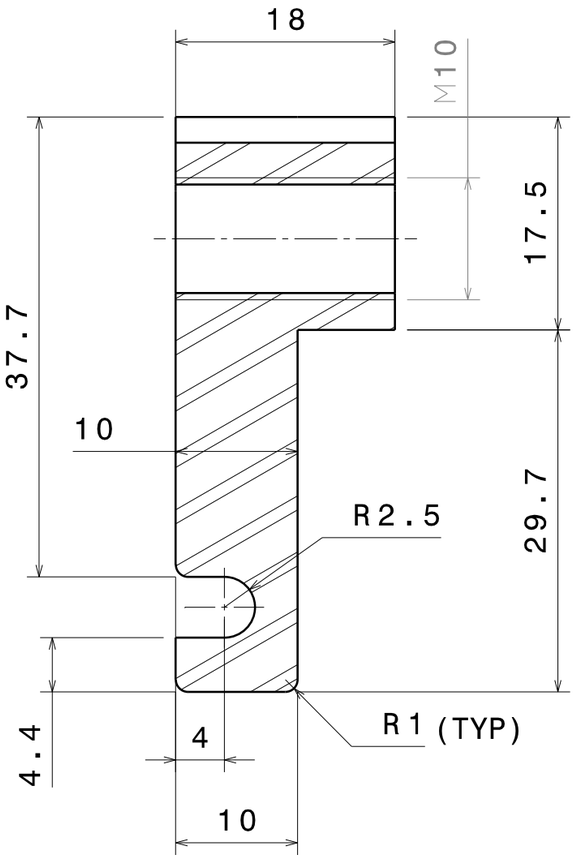


Section view A-A
Scale: 2:1

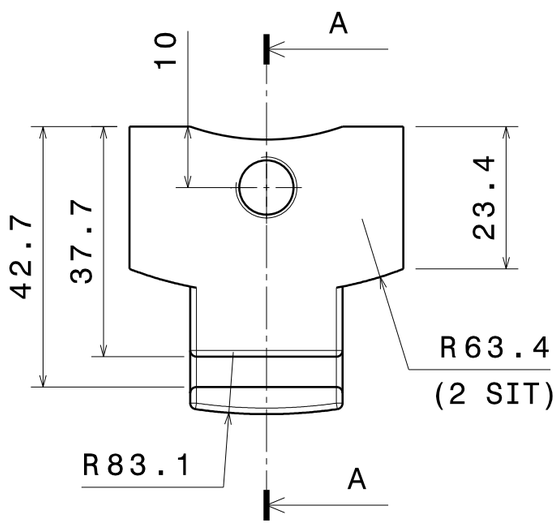
DESIGNED BY: A.Sancho		Placa unió coixinet - disc sup.	I –
DATE: 03/03/2012			H –
UPC ETSEIB			G –
			F –
SIZE A3		Sky Dome Night Characterizer	E –
			D –
SCALE 1:1	WEIGHT (kg) 0,014	DRAWING NUMBER 15 / SHEET 1/1	C –
			B –
			A –



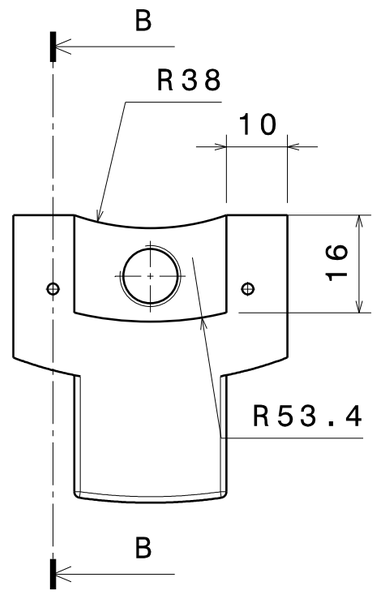
Isometric view
Scale: 1:1



Section view A-A
Scale: 2:1

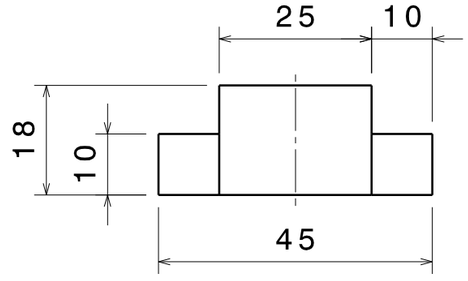


Front view
Scale: 1:1



Rear view
Scale: 1:1

Section view B-B
Scale: 2:1



Top view
Scale: 1:1

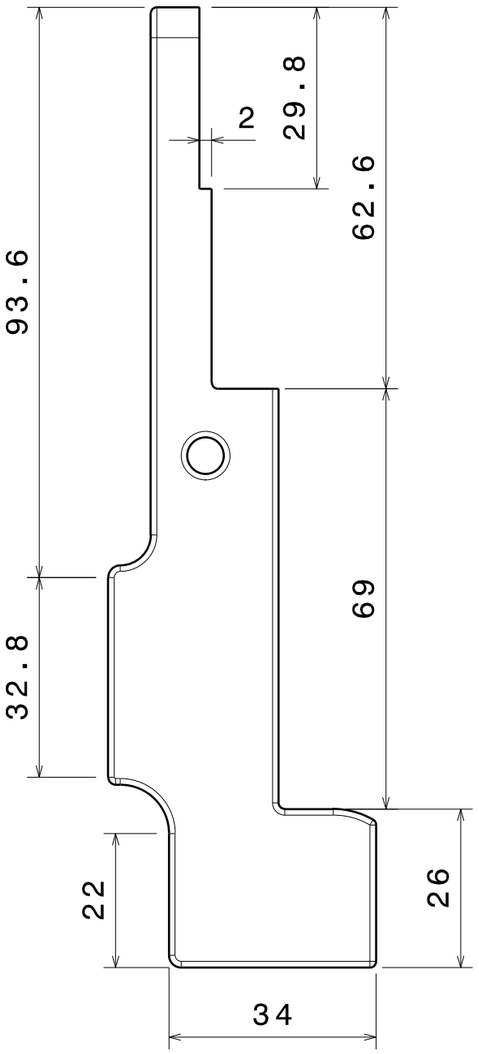
DESIGNED BY: A.Sancho
DATE: 03/03/2012

Placa unió Pin Disc Superior

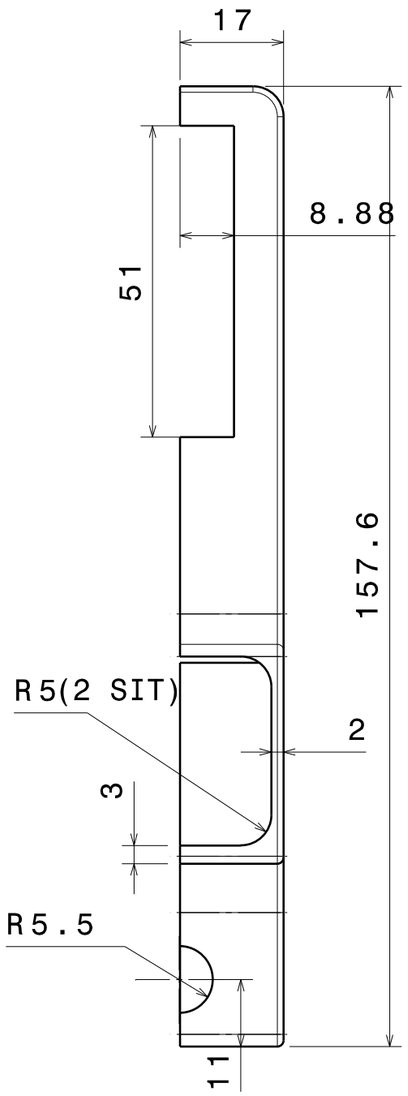
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,048	16	1/1

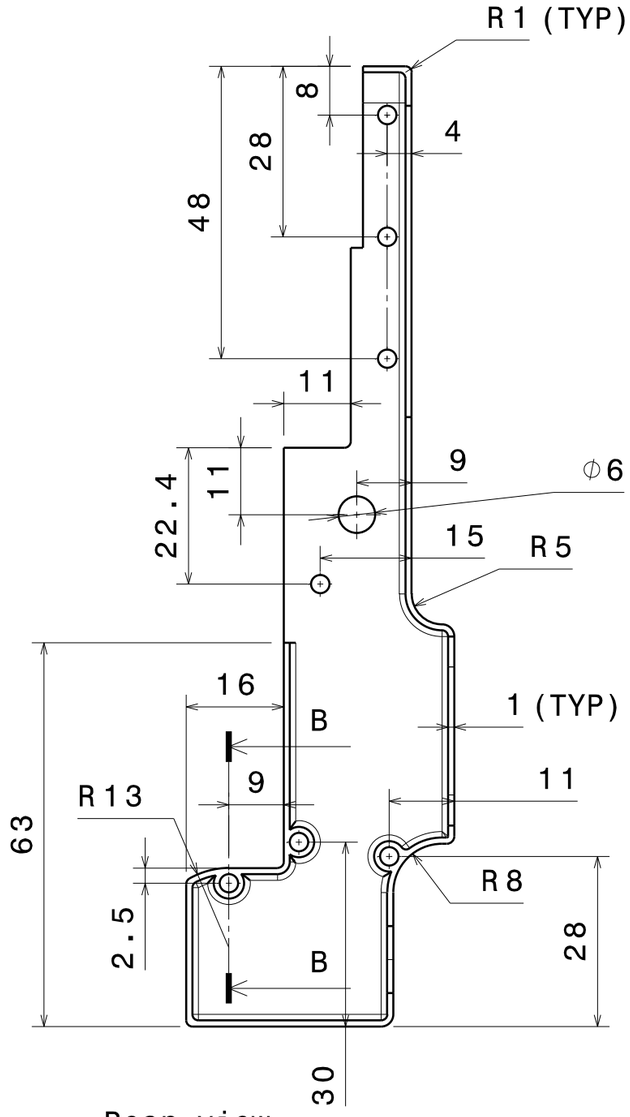
I	–
H	–
G	–
F	–
E	–
D	–
C	–
B	–
A	–



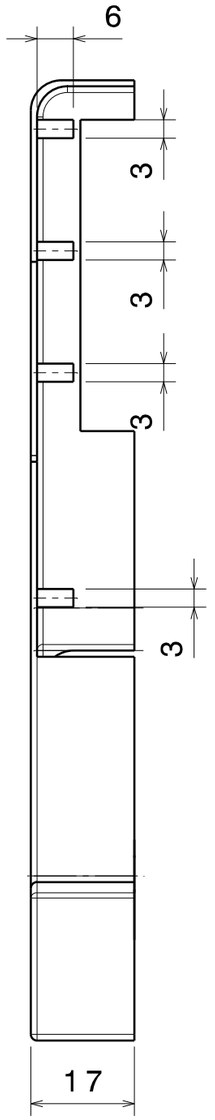
Front view
Scale: 1:1



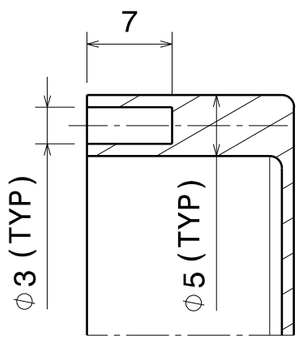
Left view
Scale: 1:1



Rear view
Scale: 1:1



Auxiliary view A
Scale: 1:1



Section view B-B
Scale: 2:1

DESIGNED BY: A.Sancho
DATE: 28/02/2012

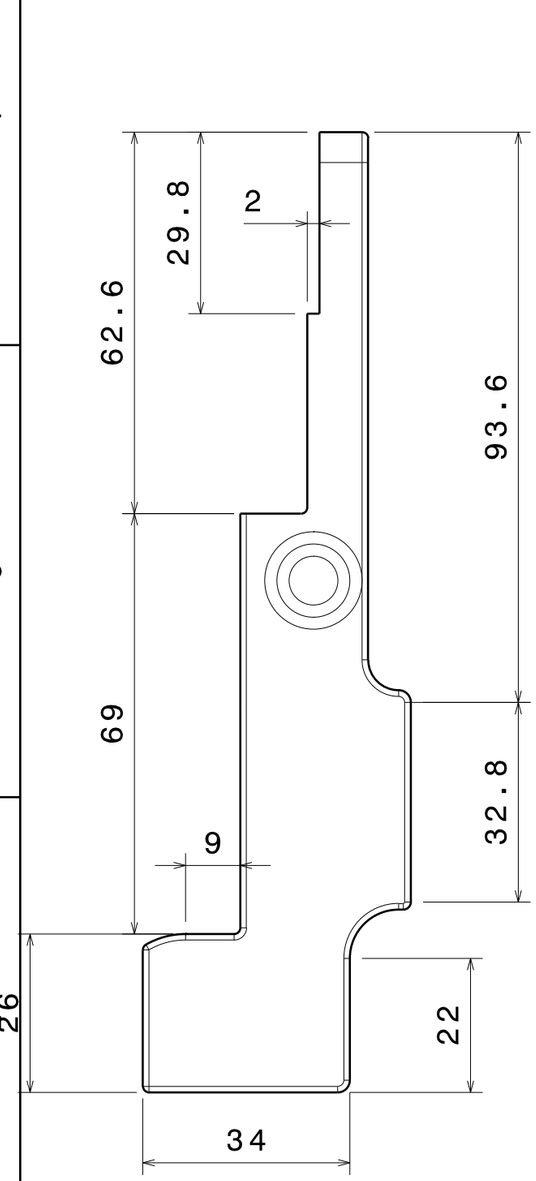
Tapa simple block

SIZE: A3

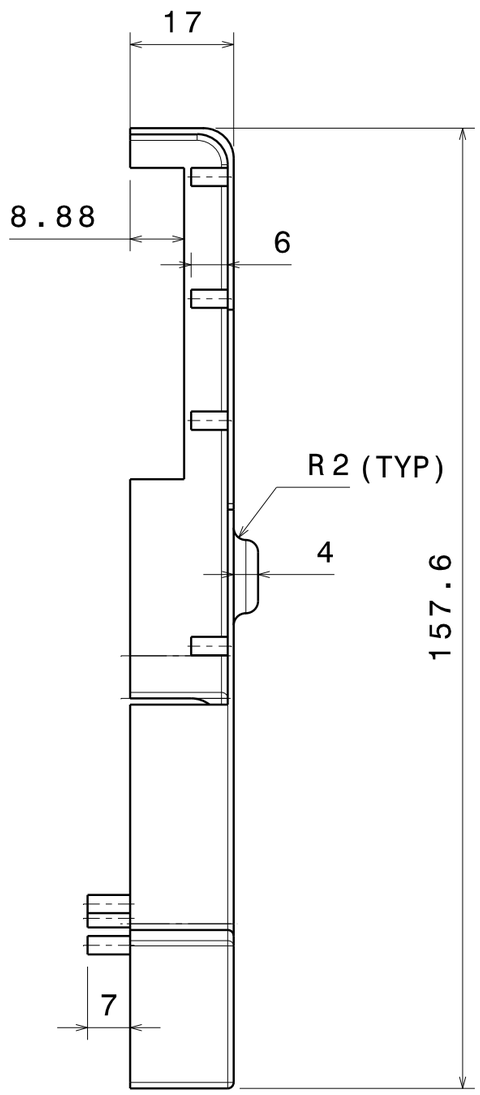
Sky Dome Night Characterizer

SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
1:1	0,009	17	1/1

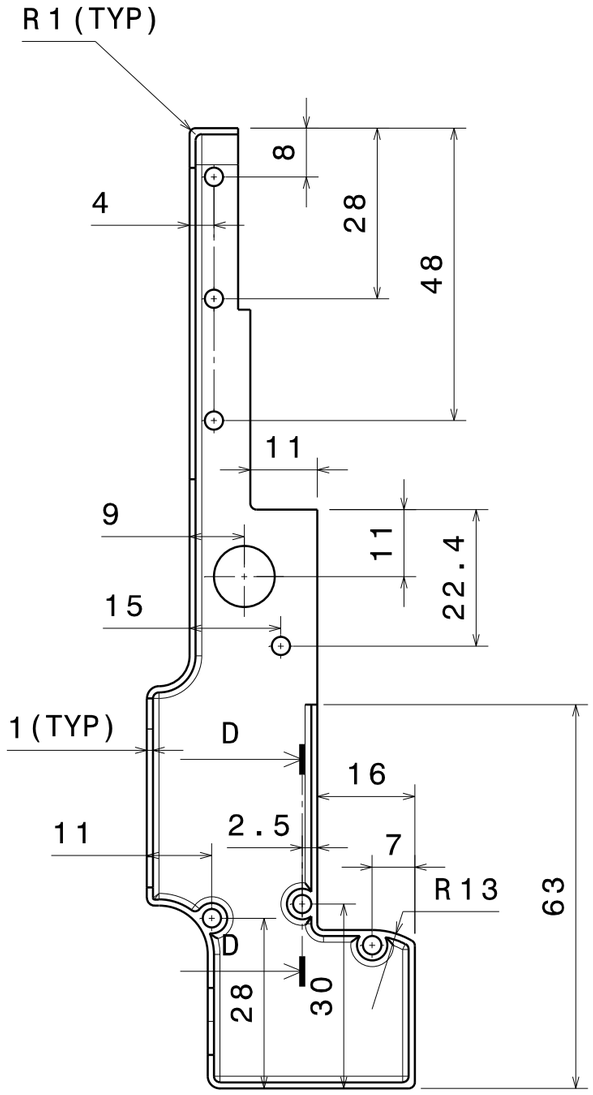
I	–
H	–
G	–
F	–
E	–
D	–
C	–
B	–
A	–



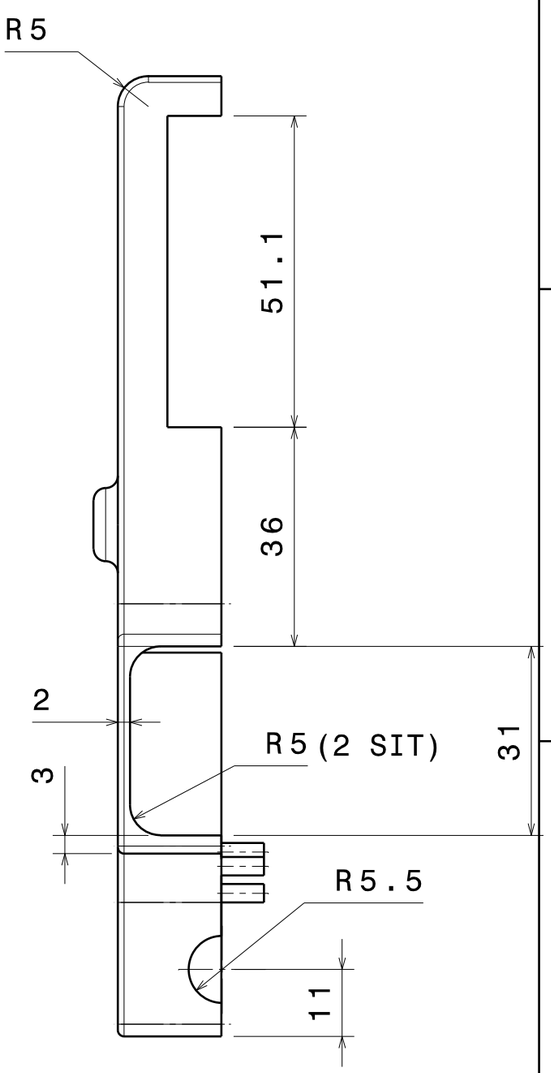
Front view
Scale: 1:1



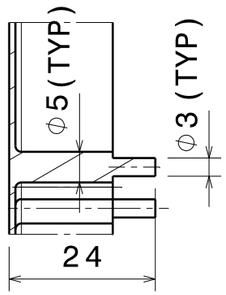
Left view
Scale: 1:1



Rear view
Scale: 1:1



Auxiliary view C
Scale: 1:1



Section view D-D
Scale: 1:1

DESIGNED BY: A.Sancho
DATE: 01/03/2012

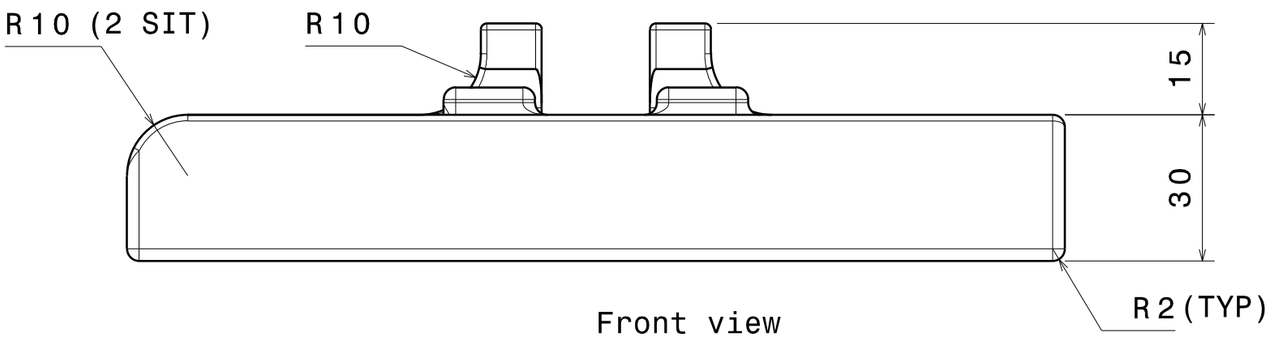
UPC ETSEIB

Simetria de Tapa simple block

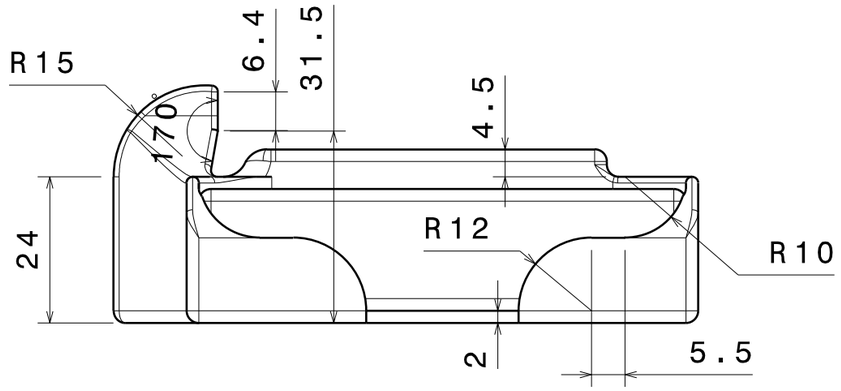
Sky Dome Night Characterizer

SIZE	SCALE	WEIGHT (kg)	DRAWING NUMBER	SHEET
A3	1:1	0,01	18	1/1

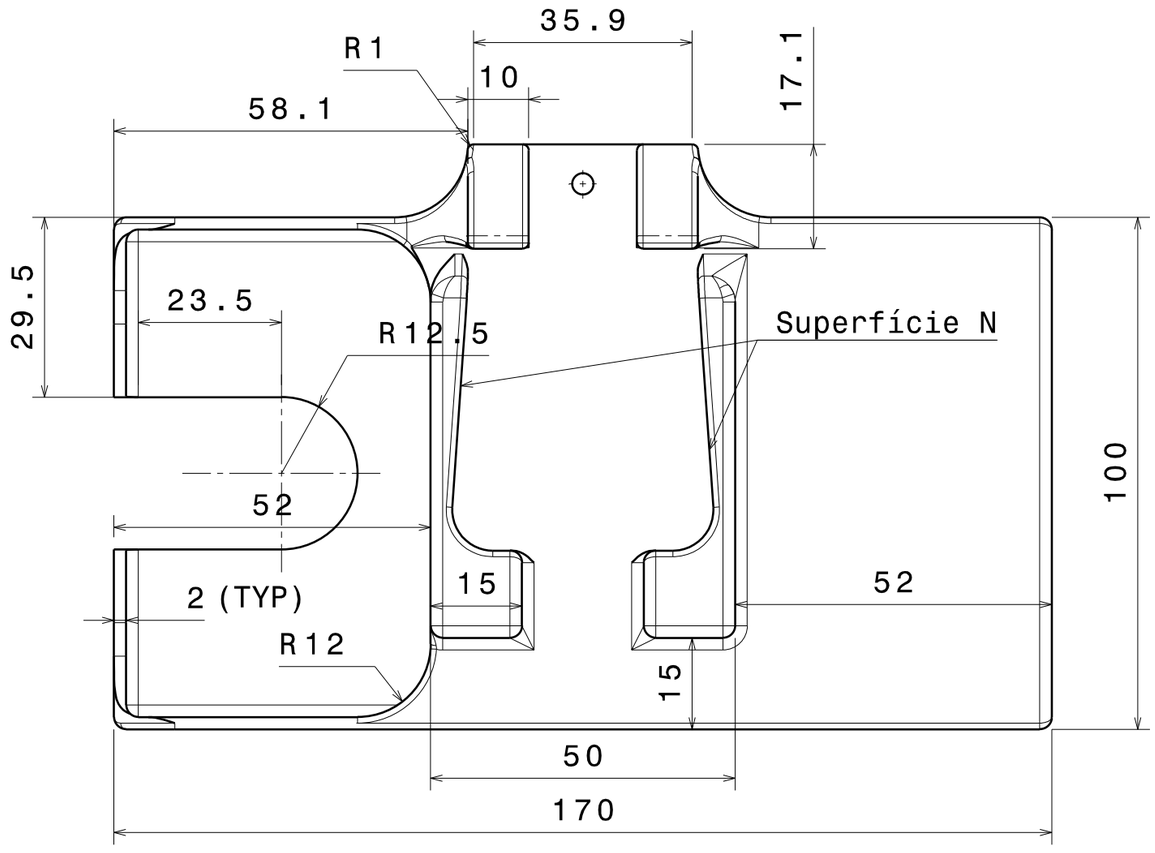
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



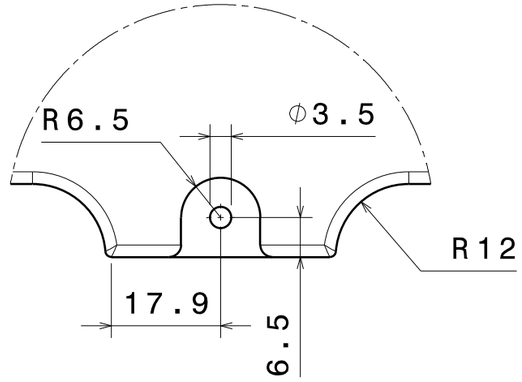
Front view
Scale: 1:1



Left view
Scale: 1:1



Top view
Scale: 1:1

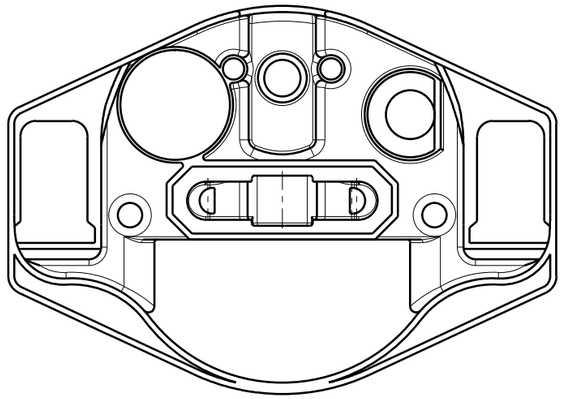


Bottom view
Scale: 1:1

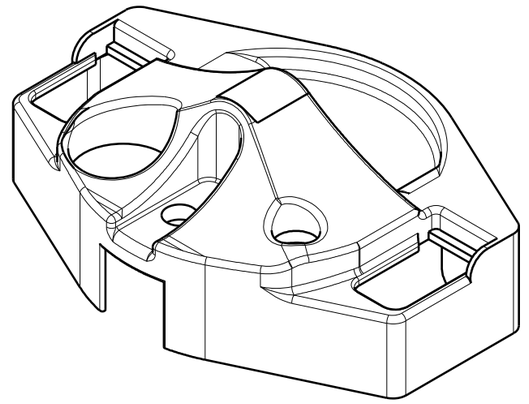
NOTA:
La superfície N és el negatiu exacte de la part "NORELEM 07774 MOD".

DESIGNED BY: A.Sancho		Safata porta mòbils	
DATE: 04/03/2012			
ETSEIB			
SIZE A3		Sky Dome Night Characterizer	
SCALE 1:1	WEIGHT (kg) 0,094	DRAWING NUMBER 19	SHEET 1/1

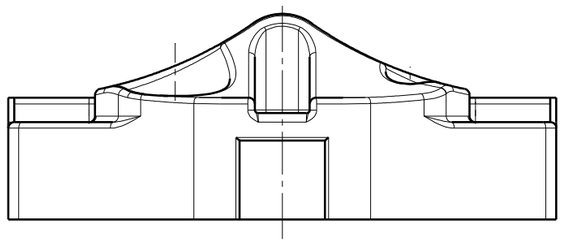
I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_



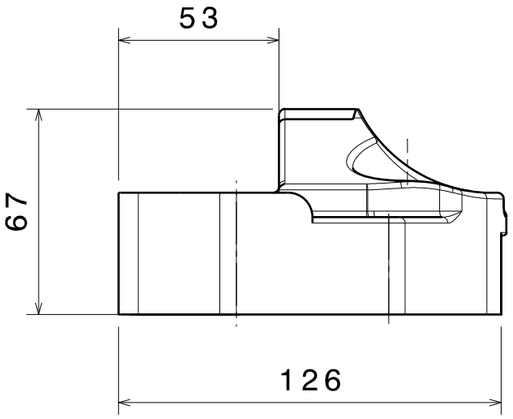
Bottom view
Scale: 1:2



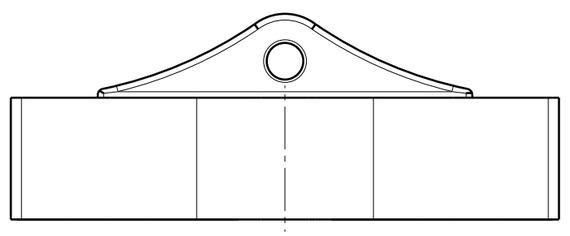
Isometric view
Scale: 1:2



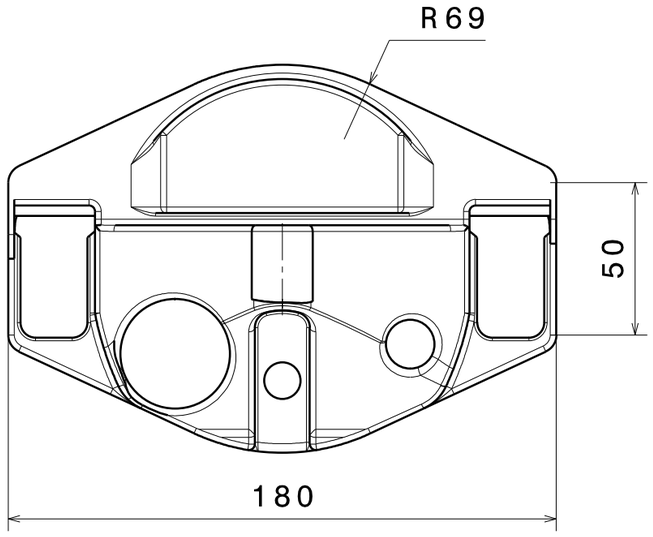
Front view
Scale: 1:2



Left view
Scale: 1:2



Rear view
Scale: 1:2



Top view
Scale: 1:2

NOTA: Es considera que la geometria de la peça és massa complexa i no té sentit acotar-la al detall. En el prototip es fabrica per extrusió 3D.

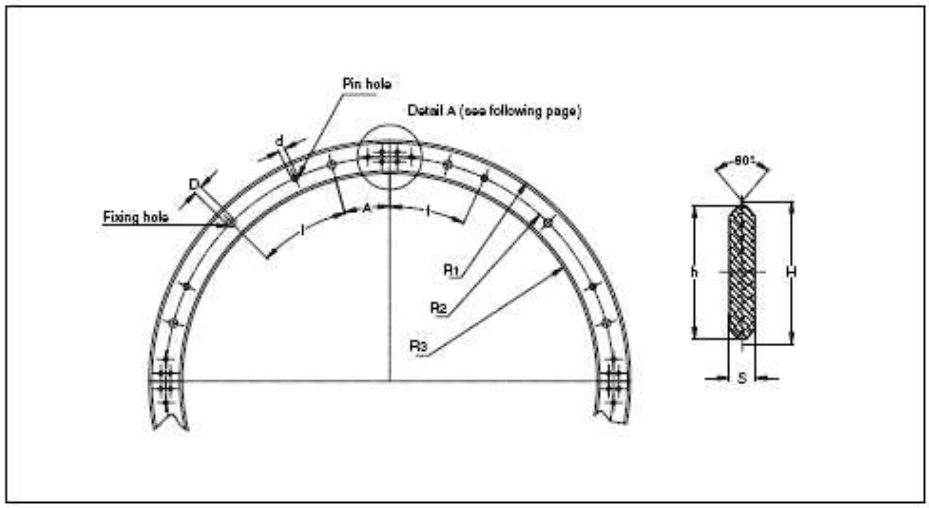
DESIGNED BY: A.Sancho DATE: 01/04/2012		Carcassa	
SIZE: A3		Sky Dome Night Characterizer	
SCALE: 1:2	WEIGHT (kg): 0,14	DRAWING NUMBER: 20	SHEET: 1/1

I	_
H	_
G	_
F	_
E	_
D	_
C	_
B	_
A	_

P. CARACTERÍSTIQUES TÈCNIQUES DELS ELEMENTS COMERCIALS UTILITZATS

P.1. Guia semicircular del fabricant NADELLA. Ref.FSR22M-075-180

Circular rails FSR..M



Type	A	I	f	d H7	D	R1*	R2*	R3*	n° fixing holes/360°	n° pin holes/360°	h	H	S
FSR22M-075	22.5°	45°	45°	5	6.5	86	75	62	8	4	26	27.86	5
FSR22M-125	15°	30°	25°	5	6.5	136	125	112	12	8	26	27.86	5
FSR22M-175	15°	30°	25°	5	6.5	186	175	162	12	8	26	27.86	5
FSR35M-225	11.25°	22.5°	7.5°	8	9	248	225	202	16	8	46	47.86	8
FSR35M-300	11.25°	22.5°	7.5°	8	9	323	300	277	16	8	46	47.86	8
FSR47M-400	9°	18°	18°	10	11.5	436	400	362	20	8	76	78.58	10
FSR47M-500	9°	18°	18°	10	11.5	536	500	462	20	8	76	78.58	10

* R1, R2, R3 are radius

Rails finishing
- steel
- induction hardened on the raceways

Hole layout
- holes according to catalogue (SB)
- finishes to drawing (NZ)

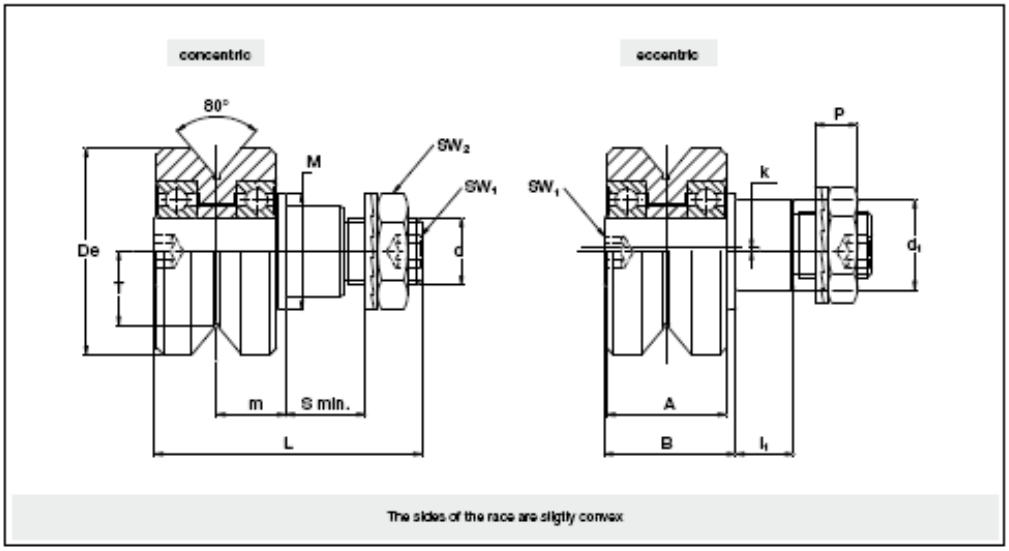
Optional features
nickel plating (NW)

Example of standard designation: FSR35M-225-180
Circular rail sector FSR35M ray 225 mm, sector angle 180°

51

P.2. Mobile block del fabricant NADELLA. Ref FR 22 EI

Guide Rollers FR..EI



Type		Dimensions (mm)														
concentric	eccentric	De	d_1 (1)	d	T	m	S min.	P	L	A	B	l_1	M	SW_1	SW_2	k
FR 22 EI	FRR 22 EI	22	9	M 6 x 1	7.7	9.4	9	6.5	37	15	18.2	8	14	4(6)	ch. 10	0.5
FR 32 EI	FRR 32 EI	32	14	M 10 x 1.25	11.6	12.6	12	8.5	50.5	21	24.5	11	20	4	ch. 16	1
FR 40 EI	FRR 40 EI	40	16	M 12 x 1.5	14.6	15.5	12	10.4	59.5	28	30.5	11	22	5	ch. 18	1
FR 52 EI	FRR 52 EI	52	21	M 16 x 1.5	19.1	19.8	15	11.4	69.5	32	36.5	14	28	6	ch. 24	1,5
FR 62 EI	FRR 62 EI	62	27	M 20 x 1.5	22.1	20.8	18.5	12.4	80.5	36	39.5	17.5	35	8	ch. 30	2

Type		Dynamic load (N)	Limit loads of the bearing (N)		Limit loads of the stud (N)		Life coefficients		Torque wrench (2) settings (Nm)	Weight (g)
		C_w (4)	radial C_{or}	axial C_{oa}	radial F_r	axial F_a	X	Y		
FR 22 EI	FRR 22 EI	1 600	1 060	350	1 700	720	1	2.20	3	45
FR 32 EI	FRR 32 EI	4 400	2 330	750	1 200	500	1	2.92	20	130
FR 40 EI	FRR 40 EI	7 350	4 000	1 300	3 000	1 300	1	2.75	26	260
FR 52 EI	FRR 52 EI	9 500	5 500	1 750	7 500	3 000	1	2.96	64	510
FR 62 EI	FRR 62 EI	15 500	8 500	2 750	10 900	4 200	1	3.07	120	820

1) Housing bore tollerance: H7
2) The torque wrench settings are given for non-lubricated threads; for lubricated threads, multiply figure by 0.8
3) On request, the guide rollers can be supplied in stainless steel (suffix NX)
4) Cw basic load for 100 km
5) The guide rollers are complete with self-locking washers and hexagonal nut (DIN 439B) for fitting
6) Pressure angle α for load calculation: 40°
7) NBR seals RS type
8) Screw driver slot on the stud side

39

P.3. Locking bolts without collar fabricant NORELEM. Ref.03094-01105

nlm 03094

Locking Bolts

without collar

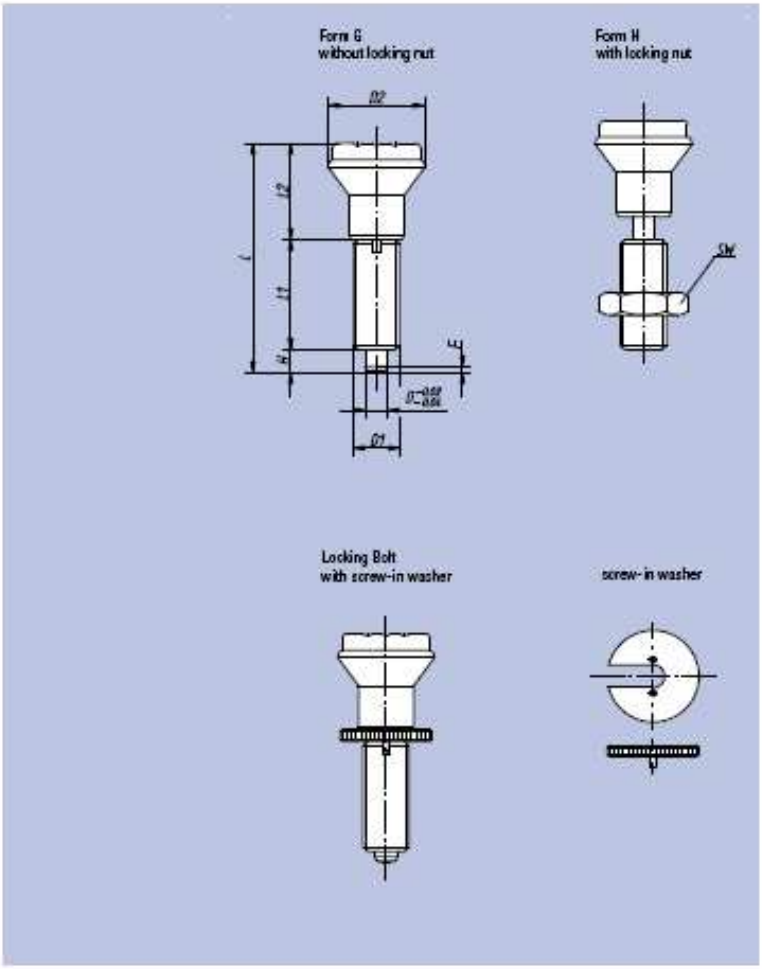
Material:
- Steel version, locking pin hardened: quality class 5.8
- Stainless steel version, locking pin hardened: threaded sleeve 1.4305 locking pin 1.4034
- Stainless steel version, locking pin not hardened: threaded sleeve 1.4305 locking pin 1.4305

Mushroom knob in anthracite grey thermoplastic

Surface finish:
- Steel version, locking pin hardened: black oxide finish, locking pin ground
- Stainless steel version, locking pin hardened: natural finish, locking pin ground
- Stainless steel version, locking pin not hardened: natural finish, locking pin ground

Sample order:
nlm 03094-02206

Note:
Locking Bolts are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the bolt has been manually disengaged.
In order to screw in the locking bolts, a screw-in washer can be supplied. The washer is slid beneath the disengaged mushroom knob so that the follower pins engage in the slot.
On request:
Special versions.



norelem

ETSEIB

nlm 03094

Locking Bolts

without collar

03000

Locking Bolts without collar, in steel, locking pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03094-1105	03094-2105	5	M10x1	21	47	24	18	5	17	1,3	5	12	03094-01
03094-1206	03094-2206	6	M12x1,5	25	56	28	22	6	19	1,8	6	14	03094-02
03094-1308	03094-2308	8	M16x1,5	33	74	36	30	8	24	2,3	15	35	03094-03
03094-1410	03094-2410	10	M20x1,5	33	80	40	30	10	30	2,8	15	34	03094-04

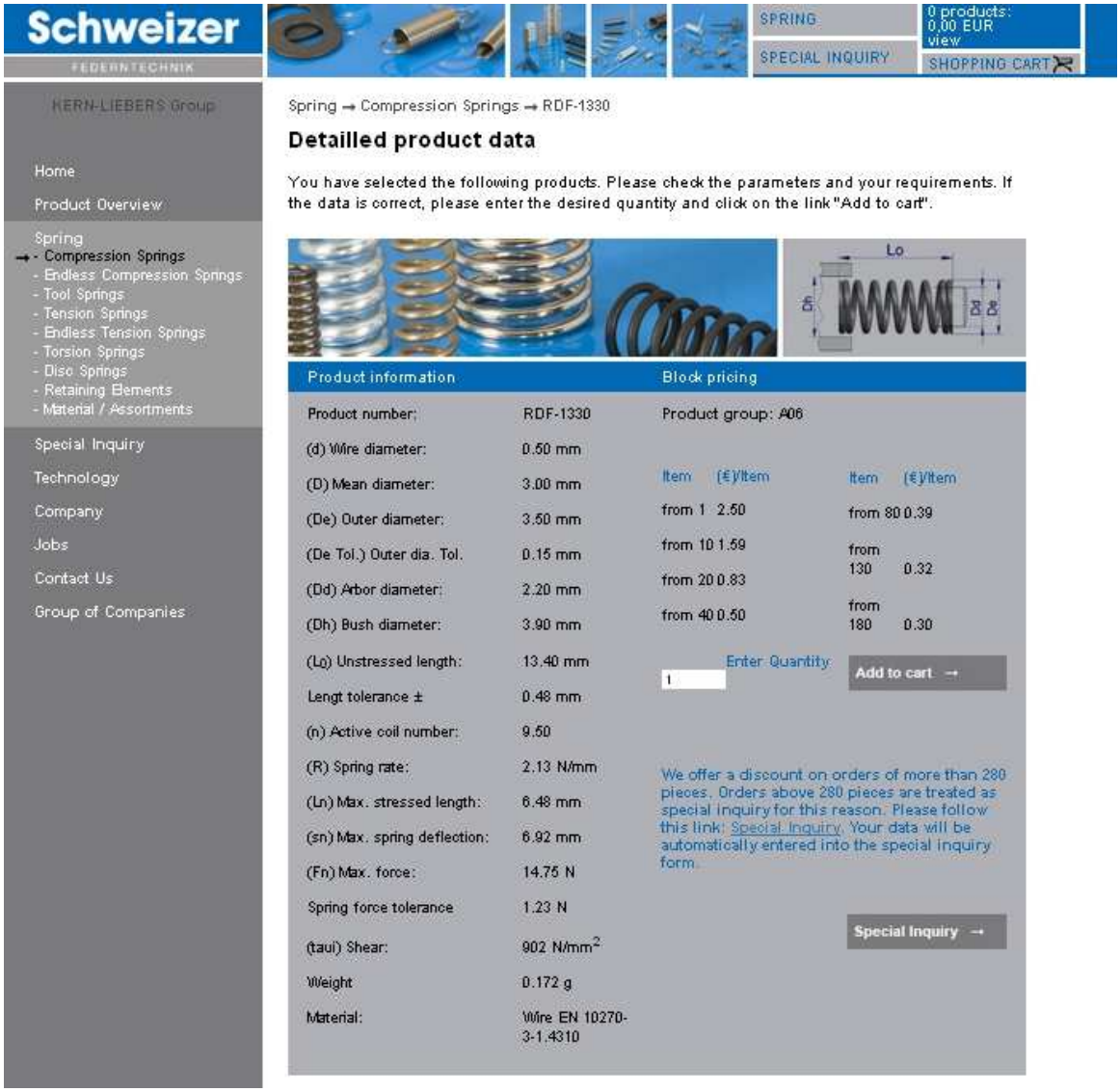
Locking Bolts without collar, in stainless steel, locking pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03094-01105	03094-02105	5	M10x1	21	47	24	18	5	17	1,3	5	12	03094-01
03094-01206	03094-02206	6	M12x1,5	25	56	28	22	6	19	1,8	6	14	03094-02
03094-01308	03094-02308	8	M16x1,5	33	74	36	30	8	24	2,3	15	35	03094-03
03094-01410	03094-02410	10	M20x1,5	33	80	40	30	10	30	2,8	15	34	03094-04

Locking Bolts without collar, in stainless steel, locking pin not hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03094-11105	03094-12105	5	M10x1	21	47	24	18	5	17	1,3	5	12	03094-01
03094-11206	03094-12206	6	M12x1,5	25	56	28	22	6	19	1,8	6	14	03094-02
03094-11308	03094-12308	8	M16x1,5	33	74	36	30	8	24	2,3	15	35	03094-03
03094-11410	03094-12410	10	M20x1,5	33	80	40	30	10	30	2,8	15	34	03094-04

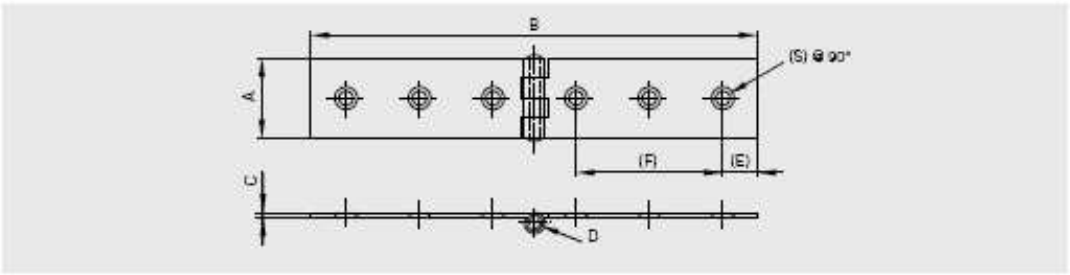
P.4. Molla fabricant SCHWEIZER. Ref.RDF-1330



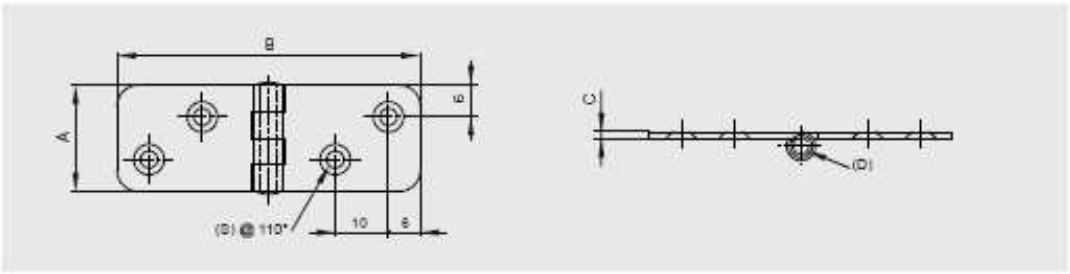
P.5. Junta base-semidisc fabricant PINET. Ref. 50-7-3332

Hinges

A	B	C	D	E	F	S	note	part number	material	finish	weight
25	140	1.5	3.5	11	46	3.5	riveted pin	50-7-3880	steel	raw	45g
30	160	1.5	3.5	11	54	3.5		50-7-3881	steel	raw	60g
30	190	2.5	6	12.5	60	4		50-7-3341	steel	zinc plated	150g
30	220	2.5	6	13.5	75	4		50-7-3342	steel	zinc plated	165g



A	B	C	D	S	part number	material	finish	weight
20	60	1.2	3	2.5	50-7-3332	steel	raw	13g



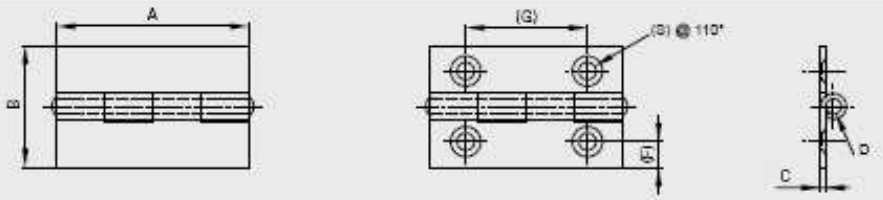
P.6. Junta caixa del fabricant PINET. Ref.50-7-3618

Hinges / Small hinges

Hinges

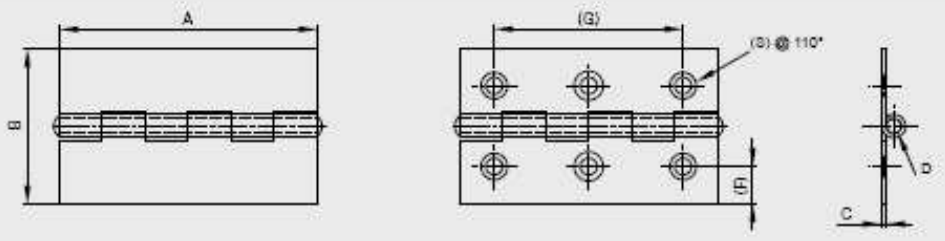
Only part number 50-7-3558 has a riveted pin

A	B	C	D	F	G	S	note	part number	material	finish	weight
30	19	0.8	2.4	4	19	2	drilled	50-7-3617	steel	raw	5.5g
30	19	0.8	2.4				undrilled	50-7-3618	steel	raw	5.6g
35	22	0.8	2.4	4	22	2.5	drilled	50-7-3549	steel	raw	7g
35	22	0.8	2.4				undrilled	50-7-3557	steel	raw	7.5g
40	25	0.9	2.7				undrilled	50-7-3558	steel	raw	10.2g
40	25	0.9	2.7	5	27	2.5	drilled	50-7-3550	steel	raw	10g
50.3	29.8	1	2.4	7.2	35.2	2.5	drilled	50-7-3551	steel	raw	15g
50.3	29.8	1	2.4				undrilled	50-7-3559	steel	raw	15.5g



All hinges have riveted pins except 50-7-3552, 50-7-3553, 50-7-3561

A	B	C	D	F	G	S	note	part number	material	finish	weight
60	35	1	3	8	44	2.5	drilled	50-7-3552	steel	raw	22.5g
60	35	1	3				undrilled / headed pin	50-7-3560	steel	raw	23g
70	41.5	1	3.5	8.7	52	3	drilled	50-7-3553	steel	raw	30g
70	41.5	1	3.5				undrilled	50-7-3561	steel	raw	40g
80	45	1.2	3.9				undrilled / headed pin	50-7-3562	steel	raw	48g
80.5	45.4	1	3.5	9.6	59.3	4	drilled / headed pin	50-7-3554	steel	raw	47g
100	50	1.5	4.9	10	77	4.5	drilled / headed pin	50-7-3555	steel	raw	80g
100	50	1.5	4.9				undrilled / headed pin	50-7-3564	steel	raw	86g



ETSEIB

P.7. Pinça del fabricant DE-STA-CO. Ref.305-u

Series 305, 307, 309 Product Overview

Features:
- Compact design suitable for use in confined spaces
- Available with DE-STA-CO® Toggle Lock Plus
- Stainless steel models available

Applications:
- Assembly & Test
- Light Machining
- Closures
- Woodworking

Also Available:
See page 8.1 for accessories

305-U†
Flanged Base
U-Bar

305-USS
Flanged Base
U-Bar, Stainless Steel

305-UR†
Flanged Base,
U-Bar with
DE-STA-CO®
Toggle
Lock
Plus

307-U†
Flanged Base
U-Bar

307-USS
Flanged Base
U-Bar, Stainless Steel

307-UR†
Flanged Base,
U-Bar with
DE-STA-CO®
Toggle
Lock
Plus

309-U†
Flanged Base
U-Bar

309-USS
Flanged Base
U-Bar, Stainless Steel

309-UR† ①
Flanged Base,
U-Bar with
DE-STA-CO®
Toggle
Lock
Plus

Note:
Clamps shown with included accessories. †To order without spindle, add (-LS) to the end of model (Ex: 307-U-LS)

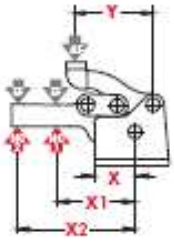
Series 305, 307, 309 Technical Information

Model	Max. Holding Capacity	Clamp Bar Opening (+10°)	Handle Opening (+10°)	Weight	Accessories (Supplied)	
					Spindle Assembly	Flanged Washers
305-U	670 N [150 lbf]	90°	170°	0,06kg [0.13lb]	305208-M	102111
305-USS	900 N [200 lbf]				201943	102911
305-UR	670 N [150 lbf]				305208-M	102111
307-U	1560 N [350 lbf]	92°	173°	0,24kg [0.54lb]	307208-M	507107
307-USS					207943	507907
307-UR					307208-M	507107
309-U	3340 N [750 lbf]	90°	168°	1,30kg [0.59lb]	309208	235106
309-USS					237943	235906
309-UR①					309208	235106

① This item is available upon request

Horizontal Hold Down Clamps 2.32

Series 305, 307, 309 Holding Capacities

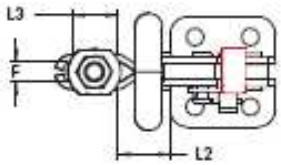


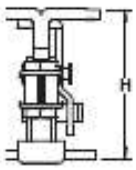
Model	X	X1	X2	Y	‡HC1	‡HC2	‡EF(X1):AF	‡EF(X2):AF
305-U/UR	[0.58] 14,6	[1.38] 35	[1.88] 47,7	[1.14] 29	[150lbf.] 670N	[110lbf.] 490N	3:1	2:1
305-USS					[200lbf.] 900N	[150lbf.] 670N		
307-U/UR/USS	[0.94] 24	[1.88] 47,7	[2.50] 63,5	[1.77] 45	[350lbf.] 1560N	[260lbf.] 1160N		
309-U/UR/USS	[1.34] 34	[2.50] 63,5	[3.50] 89	[2.70] 68,5	[750lbf.] 3340N	[530lbf.] 2360N	4:1	

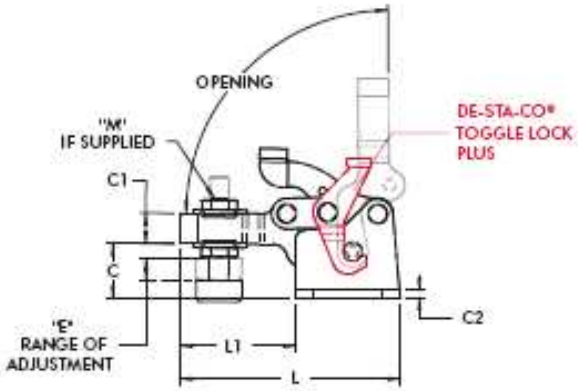
Dimensions shown "mm [inch]" ‡ HC = Holding Capacity, EF = Exerting Force, AF = Applied Force
Refer to page 20.5 for additional information.

Series 305, 307, 309 Standard Clamp Dimensions -U/-USS/-UR

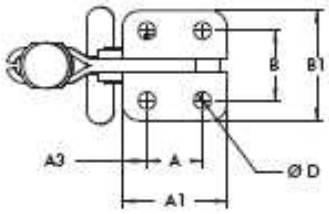
305-U‡
Flanged Base
U-Bar







307-UR‡
Flanged Base,
U-Bar with
DE-STA-CO®
Toggle
Lock
Plus



Model	A	A1	A3	B	B1	C	C1	C2	D	F	H	L	L1	L2	L3	M
305-U/UR	[0.35] 13,5	[1.02] 25,9	[0.25] 6,4	[0.63] 16,0	[1.00] 25,4	[0.48] 12,2	[0.31] 7,9	[0.08] 2,0	[0.18] 4,6	[0.21] 5,3	[1.43] 36,3	[2.21] 56,1	[1.19] 30,2	[0.51] 13,0	[0.50] 12,7	[#10] M5
307-U/UR	[0.91] 23,1	[1.72] 43,7	[0.40] 10,2	[1.14] 29,0	[1.80] 45,7	[0.89] 22,6	[0.50] 12,7	[0.12] 3,0	[0.28] 7,1	[0.33] 8,4	[2.36] 59,9	[3.61] 91,7	[1.89] 48,0	[0.86] 21,8	[0.75] 19,1	[5/16] M8
309-U/UR	[1.38] 35,1	[2.52] 64,0	[0.58] 14,7	[1.50] 38,1	[2.47] 62,7	[1.31] 33,3	[0.75] 19,1	[0.12] 3,0	[0.33] 8,4	[0.44] 10,4	[3.53] 89,7	[5.19] 131,8	[2.68] 68,1	[1.28] 32,5	[1.06] 26,9	[3/8-16] M10

ETSEIB

P.8. Rodament del fabricant INA-FAG. Ref.16006

FAG

Deep groove ball bearings 16006

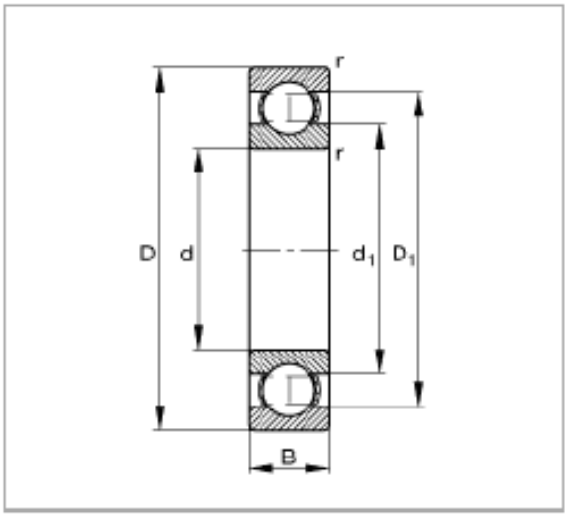
(Series 160)

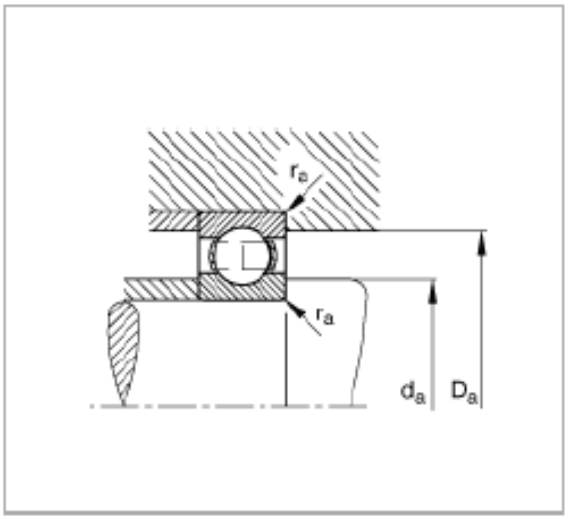
main dimensions to DIN 625-1

The datasheet is only an overview of dimensions and basic load ratings of the selected product. Please always observe all the guidelines in these overview pages. Further information is given on many products under the menu item "Description". You can also order comprehensive information via the Catalogue selection system (http://www.fag.de/content.fag.de/en/services/mediathek/library/library.jsp) or by telephone on +49 (91 32) 82 - 28 97.

d	30	mm	
D	55	mm	
B	9	mm	
D_1	47,6	mm	
d_1	37,7	mm	
D_a max	53	mm	
d_a min	32	mm	
r_a max	0,3	mm	
rmin	0,3	mm	
m	0,082	kg	Mass
Cr	11900	N	Basic dynamic load rating, radial
C0r	7300	N	Basic static load rating, radial
f0	15,2		
nG	16000	1/min	Limiting speed
nB	10600	1/min	Reference speed
Cur	365	N	Fatigue limit load, radial

ETSEIB


r
r
D
d
d_1
D_1
B


r_a
r_a
d_a
D_a

P.9. Circlips del fabricant BÉNÉ-INOX. Ref.30 i Ref.52

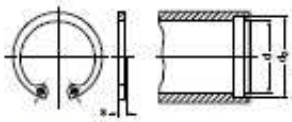
Modèle 221761

Anneau d'arrêt intérieur circlips pour alésage

Inox DIN 472

Série 21 SEGMENTS D'ARRÊT

Retaining ring for bores - Stainless steel



d_0	8,7	9,8	10,8	11,8	13	14,1	15,1	16,2	17,3	18,3	19,5	20,5	21,5
s	0,8	0,8	1	1	1	1	1	1	1	1	1	1	1

Prix en €/ 100

ø	8	9	10	11	12	13	14	15	16	17	18	19	20
Prix	65,00	75,00	75,00	93,00	93,00	93,00	98,00	98,00	103,00	130,00	115,00	125,00	139,00
Boîtage	200	200	200	100	100	100	100	100	100	100	100	100	100

d_0	22,5	23,5	24,5	25,9	26,9	27,9	28,9	30,1	31,1	32,1	34,4	36,5	38,5
s	1	1	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,5

Prix en €/ 100

ø	24	25	26	27	28	29	30	31	32	33	34	35	36
Prix	153,00	166,00	222,00	259,00	259,00	268,00	277,00	277,00	323,00	323,00	323,00	415,00	443,00
Boîtage	50	50	50	50	50	50	50	50	50	50	25	25	25

d_0	37,9	38,5	39,8	40,5	43,5	46,5	49,5	50,5	51,5	54,2	56,2	59,2	60,2
s	1,5	1,5	1,5	1,5	1,75	1,75	1,75	1,75	1,75	2	2	2	2

Prix en €/ 100

ø	35	36	37	38	40	42	45	47	48	50	52	55	58
Prix	461,00	526,00	561,00	553,00	737,00	783,00	1 014,00	1 105,00	1 105,00	1 014,00	1 060,00	1 105,00	1 202,00
Boîtage	25	25	25	25	25	25	25	25	25	25	10	10	10

d_0	64,2	66,2	69,2	72,5	74,5	76,5	79,5	85,5	90,5	95,5	100,5	105,5
s	2	2	2,5	2,5	2,5	2,5	2,5	2,5	3	3	3	3

Prix en €/ 100

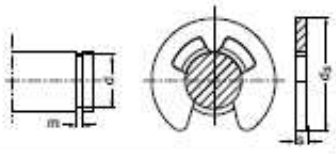
ø	60	62	65	68	70	72	75	80	85	90	95	100
Prix	•	•	•	•	•	•	•	•	•	•	•	•
Boîtage	10	10	10	10	10	10	10	5	5	5	5	5

Modèle 221762

Bague d'arrêt pour arbre - type E

Inox DIN 6799

Retaining washer for shafts - Stainless steel



d_0	6,3	7,3	9,3	11,5	12,3	14,3	16,3	18,5	20,4
n de Farbe	3-4	4-5	5-7	6-8	7-9	8-11	9-12	10-14	11-15
s	0,6	0,6	0,7	0,7	0,7	0,9	1	1,1	1,2

Prix en €/ 100

ø	3,2	3,5	4	5	6	7	8	9	10
Prix	41,20	35,40	50,00	68,40	80,30	110,20	•	•	•
Boîtage	500	500	500	500	500	200	200	100	100

P.10. Rodament del fabricant IGUS. Ref. BB-6006-B180-10-ES*

xiros® polymer ball bearings

xirodur® B180 Polymer Ball Bearings | Product Range

Radial deep-groove ball bearings

Made of xirodur® B180
PA cage, glass balls
+80 °C
–40 °C

Made of xirodur® B180
PA cage, stainless steel balls
+80 °C
–40 °C

xiros® B180 polymer ball bearings are for use with temperatures up to +80 °C. The specially developed material xirodur® B180 provides significantly longer life times at a lower cost.

- Lubrication- and maintenance-free
- Non-magnetic and washable
- Corrosion-resistant
- Predictable lifetime
- Low weight
- For shaft diameters 3–60 mm
- Electrically insulating

Dimensions [mm]

Part number		Race	Cage	Ball	Inner-Ø d1	Outer-Ø d2	Width b1
BB-623-B180-10-ES		B180	PA	1.4401	3	10	4
BB-625-B180-10-ES	New!	B180	PA	1.4401	5	16	6
BB-626-B180-10-ES		B180	PA	1.4401	6	19	6
BB-608-B180-10-ES		B180	PA	1.4401	8	22	7
BB-6000-B180-10-ES		B180	PA	1.4401	10	26	8
BB-6001-B180-10-ES		B180	PA	1.4401	12	28	8
BB-6002-B180-10-ES	New!	B180	PA	1.4401	15	32	9
BB-6003-B180-10-ES		B180	PA	1.4401	17	35	10
BB-6004-B180-10-ES		B180	PA	1.4401	20	42	12
BB-6005-B180-10-ES		B180	PA	1.4401	25	47	12
BB-6006-B180-10-ES*		B180	PA	1.4401	30	55	13
BB-6007-B180-10-ES*		B180	PA	1.4401	35	62	14
BB-6008-B180-10-ES*		B180	PA	1.4401	40	68	15
BB-6009-B180-10-ES*		B180	PA	1.4401	45	75	16
BB-6010-B180-10-ES*		B180	PA	1.4401	50	80	16
BB-6011-B180-10-ES*		B180	PA	1.4401	55	90	18
BB-6012-B180-10-ES*		B180	PA	1.4401	60	95	18
BB-623-B180-10-GL		B180	PA	Glass	3	10	4
BB-625-B180-10-GL	New!	B180	PA	Glass	5	16	6
BB-626-B180-10-GL		B180	PA	Glass	6	19	6
BB-608-B180-10-GL		B180	PA	Glass	8	22	7
BB-6000-B180-10-GL		B180	PA	Glass	10	26	8
BB-6001-B180-10-GL		B180	PA	Glass	12	28	8
BB-6002-B180-10-GL	New!	B180	PA	Glass	15	32	9
BB-6003-B180-10-GL		B180	PA	Glass	17	35	10
BB-6004-B180-10-GL		B180	PA	Glass	20	42	12
BB-6005-B180-10-GL		B180	PA	Glass	25	47	12
BB-6006-B180-10-GL*		B180	PA	Glass	30	55	13
BB-6007-B180-10-GL*		B180	PA	Glass	35	62	14
BB-6008-B180-10-GL*		B180	PA	Glass	40	68	15
BB-6009-B180-10-GL*		B180	PA	Glass	45	75	16
BB-6010-B180-10-GL*		B180	PA	Glass	50	80	16
BB-6011-B180-10-GL*		B180	PA	Glass	55	90	18
BB-6012-B180-10-GL*		B180	PA	Glass	60	95	18

686 Lifetime calculation, 3D-CAD data, PDF downloads ▶ www.igus.eu/eu/xiros

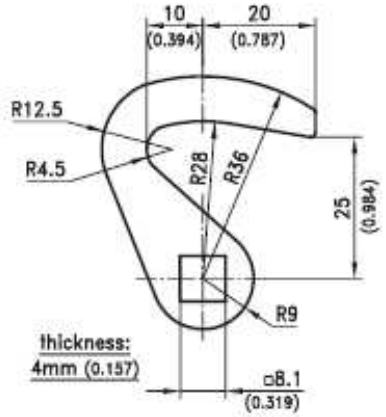
ETSEIB

P.11. Ganxo del fabricant DIRAK. Ref.200-1703

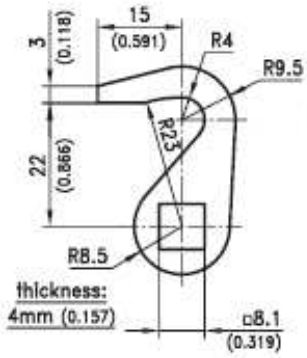
DIRAK
www.dirak.com

Hooked Cam

Page
1 - 260



Part No. 200-1701



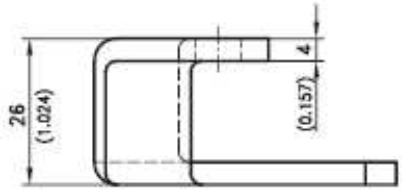
Part No. 200-1703

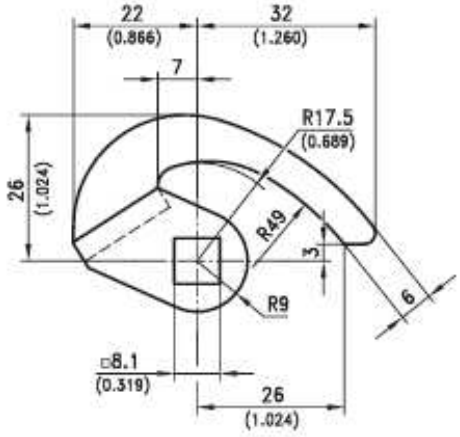
Hooked cam suitable for all 200-series latches and handles.

- **Please note:** When assembling 200-1701 or 200-1703 by DIRAK, please indicate the locking direction of the cam.
- 200-1702 only clockwise operation.

Material:

- **Hooked cam:** steel, zinc plated





Part No. 200-1702

12/14/05

DIRAK GmbH & Co. KG - Königsfelder Str. 1 - D-58256 Ennepetal - Phone: +49 (0) 2333/837-0 - Fax: +49 (0) 2333/837-100

P.12. Brúixola fabricant GUANGZHOU E. T. LTD. Ref.EM1835

EM1815-1 Button Compass, Dia15.1mm, 0.8g
Packing: 20Pcs/Pack
Inner Box Meas.: 25.5*12*6.3CM
Qty Per Inner Box: 840Pcs/Inner Box, 42Packs/Inner Box
Weight per Innner Box: 790g/Inner Box
Ctn Meas.: 33*26.5*25.5cm -GU
Qty Per Ctn: 8400 Pcs/Inner Box, 10 Inner Boxes/Ctn
G.W./N.W.: 9.5/8.5Kgs

EM1816-5 Button Compass, Dia16.5mm, 0.9g
Packing: 20Pcs/Pack
Inner Box Meas.: 25.5*12*6.3CM
Qty Per Inner Box: 840Pcs/Inner Box, 42Packs/Inner Box
Weight per Innner Box: 850g/Inner Box
Ctn Meas.: 33*26.5*25.5cm -GU
Qty Per Ctn: 8400 Pcs/Inner Box, 10 Inner Boxes/Ctn
G.W./N.W.: 9/8Kgs

EM1817-B Button Compass, Dia17mm, 1.1g
Magnetic Induction: 500 Gauss
Packing: 20Pcs/Pack
Inner Box Meas.: 13.5*12.5*7.8CM
Qty Per Inner Box: 300Pcs/Inner Box, 15Packs/Inner Box
Weight per Innner Box: 440g/Inner Box
Ctn Meas.: 28*26*41cm -GU
Qty Per Ctn: 6000 Pcs/Inner Box, 20 Inner Boxes/Ctn
G.W./N.W.: 10/9Kgs

EM1820-4 Button Compass, Liquid, Dia20.4mm, 2.3g
EM1827 Button Compass, Liquid, Dia27mm, 3.2g
EM1835 Button Compass, Liquid, Dia35mm, 8.4g
EM1840 Button Compass, Liquid, Dia40mm, 12g

P.13. Nivell fabricant HUIDE L. I. CO.Ref. MC10-281613(Lum)

Home | About us | News | Products | Service | Feedback | Contact us | Products Search | Search | SEARCH

PRODUCTS CATEGORY

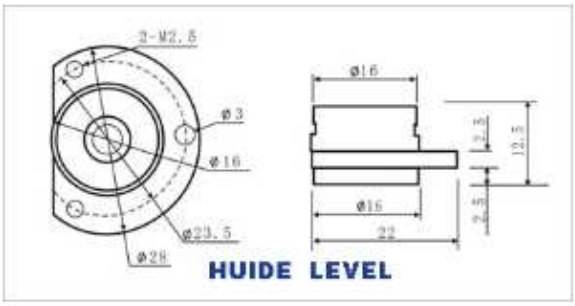
- Glass tubular spirit level bubble vial
  - High precision level vials
  - Precision level vials
  - Bent glass level vials
- Glass circular spirit level bubble
  - Glass circular spirit level bubble
- Metal spirit level
  - Instrument spirit level
  - Metal circular bubble levels
- Plastic circular spirit level bubble
  - Plastic circular level bubble
- Plastic tubular spirit level vials
  - Plastic tubular level vials
- Spirit levels
  - Torpedo spirit levels
  - 2 Axis spirit levels
  - Mini spirit levels
- Sensor vial
  - Sensor vial
- Self illuminated spirit level
  - Metal self illuminated bubble level
- Special spirit level bubble
  - Special spirit level bubble
  - Camera spirit level

visitors : 499 Copyright Reserved HUIDE Level Instrument Co., Ltd.

Product code : MC10-281613(Luminous)

Description:

Code: MC10-281613(Luminous)
Name: Metal self illuminated bubble level
Size: Ø28x16x12.5mm
Sensitivity: 5'-60'/2mm



P.14. Trípode ALUM.distribuïdor CABLEMATIC.COM. Ref.EV22

Trípode fotogràfic d'alumini 650-1700mm gamma bàsica

Referència: EV22

Totes les fotos, prem per ampliar

EV22 Descripció

Trípode econòmic fabricat en alumini d'alta qualitat. Detalls i juntes fabricades en plàstic de color negre. Per a fixació de càmeres fotogràfiques o càmeres de vídeo basades en rosca d'1/4 ". Disposa de nivell tipus bombolla a la base de la peanya de suport i de nivell circular tipus bombolla en l'eix central del trípode. Nanse d'adherència al eix central i peus amb eix de rotació per adaptar-se millor a la inclinació del terreny. Es subministra amb bossa de transport fabricada en lona de color negre. Alçada plegat (mínima): 630 mm. Alçada totalment desplegat (màxima): 1,700 mm. Pes net: 1,500 g. Càrrega màxima: 5 Kg

EV22 Escalat de preus

PVP	PVD1	PVD2	PVD3
28,30 €	22,06 €	21,13 €	20,27 €

Aquest producte el trobareu a:

P.15. Motxilla del fabricant DECATHLON. Ref. Alpinism 22

DECATHLON

Adjunta CV Contactar | Quina és la teva botiga? | El meu compte online | Seguiment de la meva co | Targeta Decathlon | CISTELL 0 Producte

INICI ESPORTS TÈXTIL DESTACATS ACCESSORIS CALÇAT BANYADORS FI DE TEMPORADA Cercar

Estàs aquí : Inici / Escalada / Productes blaus / Muntanya / **Motxilla Alpinism 22**

ZOOM

Motxilla Alpinism 22 Quechua

(Codi : 8127351)

Una motxilla per a tot, compacta i robusta.

CONCEBUT PER ESCALADORS, ALPINISTES i ESQUIADORS DE TRAVESSA que practiquen curses d'un dia.

Veure tota la informació del producte

TALLA/COLOR :

VERDE .

Quina talla escollir ?

QUANTITAT : 1

COMPRAR ONLINE (DESPESES D'ENTREGA NO INCLOSES) **IMP IND INCL.
Termini mig : 2 Dies laborables

21,95 € * Afegir al cistell

PREU DE VENDA ACONSELLAT PER LA BOTIGA IMP IND INCL.

21,95 €* Escull la teva botiga i reserva

☆☆☆☆☆

Donen's la teva opinió

Me gusta

ELS NOSTRES SERVEIS PER AQUEST PRODUCTE

LLIURAMENT A MIDA
Recollida a un punt d'entrega o enviament a domicili.

SATISFET 100%
30 dies per canvis o devolucions.

SERVEI POST-VENTA.
A totes les tendes Decathlon.

P.16. Bateries de 9V del fabricant VARTA. Ref.HR6F22

VARTA

Home Products Rechargeables Power Accus 9V 200 mAh back to Rechargeables Overview

RECHARGEABLE
POWER ACCUS

Ordinary rechargeables get discharged during storage and lose much of their capacity. With VARTA Ready2Use rechargeables you won't have much of a capacity problem. Once charged these new batteries still retain 80% of their capacity after one year of storage. VARTA Ready2Use rechargeables do not require a special charger and can be used for all applications.

Power Accus AA 2400 mAh | Power Accus AA 2500 mAh | Power Accus C 3000 mAh | Power Accus D 3000 mAh | Power Accus 9V 200 mAh

POWER ACCUS 9V 200 mAh

Powerful product range with all relevant sizes and capacities

Suitable for all chargers

DETAILS

VARTA Type	56722
Reference IEC	HR6F22
Battery Size	9V
Weight	32.0 gr
Electrochemical System	Nickel-metal Hydride (NI/MH)
Capacity	200 mAh
Voltage	8.4 V

ETSEIB

P.17. Inseriments HELICOIL© del distribuïdor NORELEM

HeliCoil®plus Threaded Inserts

Material:
Rust and acid-resistant chromium-nickel alloy 1.4301

Surface finish:
Natural finish

Sample order:
nlm 07645-01 (assortment box)

Note:
HeliCoil®plus threaded inserts are an indispensable aid to any metalworking business and restoration shop. Threaded holes that are torn out, rusted solid or have been drilled too big, can have their original internal thread diameter restored in minutes. Technically perfect and lasting for an unlimited time, they are also corrosion and heat-resistant. It is even possible to recycle expensive products thrown away.
As a result of the high surface quality an optimum limit of elasticity and high pre-tensioning of high tensile bolts is guaranteed.
HeliCoil®plus threaded inserts are also ideally suited for movable threads in all light-alloy and cast parts. Instructions for installation and thread are enclosed in the assortment box. Additional dimensions, of installation tools as well, available on request.

Assortment Box
Assortment box consisting of M5 to M12 threaded inserts, each in three different thread lengths, spiral drills (only for M5 - M10 inserts), special hand-operated tapping drills, spindle inserts and pin breakers.

Repair Kits
Consisting of threaded inserts of one size, each in three different thread lengths, spiral drills, special hand-operated tapping drills, spindle inserts and pin breakers.

Order No.	Surface finish	Threads included in product range	Number of Threaded Inserts pieces	Length of Inserts in the Assembled state mm
07645-01	assortment box	M5	10	5 / 7,5 / 10
		M6	10	6 / 9 / 12
		M8	10	8 / 12 / 16
		M10	10	10 / 15 / 20
		M12	10	12 / 18 / 24

Order No.	Surface finish	Threaded Inserts	Number of Threaded Inserts pieces	Length of Inserts in the Assembled state mm
07645-0523	repair kits	M5	each length 20	5 / 7,5 / 10
07645-0623	repair kits	M6	each length 20	6 / 9 / 12
07645-0823	repair kits	M8	each length 10	8 / 12 / 16
07645-1023	repair kits	M10	each length 10	10 / 15 / 20
07645-1223	repair kits	M12	each length 10	12 / 18 / 24

Order No.	Surface finish	Threaded Inserts	Length of Inserts in the Assembled state mm
07645-0521	spare threaded inserts, loose	M5	5
07645-0531	spare threaded inserts, loose	M5	7,5
07645-0541	spare threaded inserts, loose	M5	10
07645-0621	spare threaded inserts, loose	M6	6
07645-0631	spare threaded inserts, loose	M6	9
07645-0641	spare threaded inserts, loose	M6	12
07645-0821	spare threaded inserts, loose	M8	8
07645-0831	spare threaded inserts, loose	M8	12
07645-0841	spare threaded inserts, loose	M8	16
07645-1021	spare threaded inserts, loose	M10	10
07645-1031	spare threaded inserts, loose	M10	15
07645-1041	spare threaded inserts, loose	M10	20
07645-1221	spare threaded inserts, loose	M12	12
07645-1231	spare threaded inserts, loose	M12	18
07645-1241	spare threaded inserts, loose	M12	24

previously

subsequently

norelem

ETSEIB

nlm 07660

Threaded Inserts

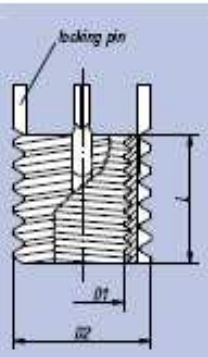
Material, surface finish:
Threaded insert in steel or stainless steel, passivated

Sample order:
nlm Threaded Insert 07660-12
nlmAssembly tool 07660-812

Note:
Threaded inserts allow threaded holes which have been damaged, torn out or jammed to be used again or repaired. This makes it possible to recover scrap and rejects of expensive products. Threaded inserts are suitable for use in various materials, including light metals and casting.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations:
the medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads. Other dimensions ±0.25 mm.

Technical information see operating instructions for threaded inserts.

Benefits:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are needed besides the assembly tool.



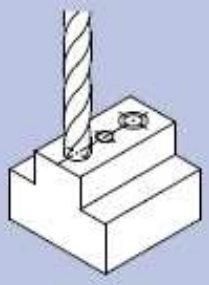
Order No. Material steel	Order No. Material stainless steel	Internal thread D1	External thread D2	Length L	Installation drill Ø	Installation countersunk Ø +0,25	Installation screw tab	Installation Min. thread depth	Removal drill Ø	Removal drilling depth	Order No. Assembly tool
07660-05	07660-105	M5	M8	8	6,0	8,3	M8	9,5	5,5	4	07660-805
07660-06	07660-106	M6	M10x1,25	10	8,8	10,3	M10x1,25	11,5	7,5	4,8	07660-806
07660-08	07660-108	M8	M12x1,25	12	10,8	13,3	M12x1,25	13,5	9,5	4,8	07660-808
07660-08X1	07660-108X1	M8x1	M12x1,25	12	10,8	12,3	M12x1,25	13,5	9,5	4,8	07660-808
07660-10	07660-110	M10	M14x1,5	14	12,8	14,3	M14x1,5	15,5	11,5	4,8	07660-810
07660-10X125	07660-110X125	M10x1,25	M14x1,5	14	12,8	14,3	M14x1,5	15,5	11,5	4,8	07660-810
07660-12	07660-112	M12	M16x1,5	16	14,8	16,3	M16x1,5	17,5	13,5	4,8	07660-812
07660-12X125	07660-112X125	M12x1,25	M16x1,5	16	14,8	16,3	M16x1,5	17,5	13,5	4,8	07660-812

07000

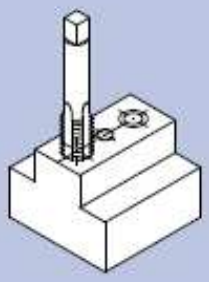
norelem 637

Operating Instructions for Threaded Inserts

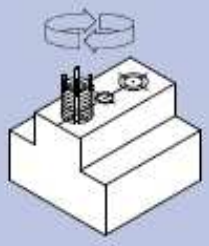
Mounting instructions



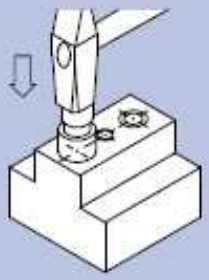
1.*
Rebore the old thread and countersink it (82° – 100°)



2.*
Tap planned thread with a standard screw tap



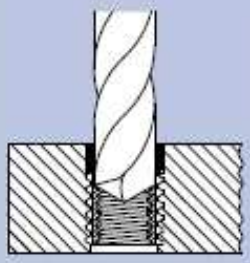
3.
Screw in the insert to just below the surface (0.3 – 0.7 mm)



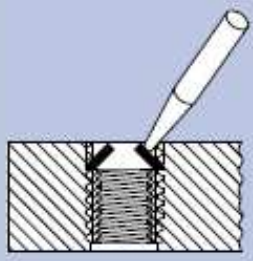
4.
Drive in the locking pins by striking the assembly tool lightly with a hammer

* For steps 1 and 2 see table under installation of threaded inserts

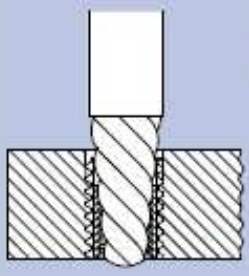
Demounting instructions



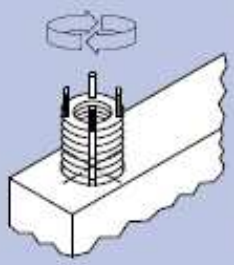
1.*
Rebore the material between the locking pins and the internal thread to the specified depth



2.
Bend the locking pins inwards and break them off



3.
Remove the old insert with a screw extractor



4.
Install a new threaded insert in the original threaded hole

* For step 1 see table under removal of threaded inserts

07000

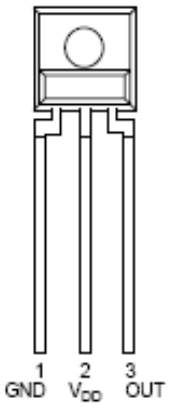
P.18. Sensor de l'SQM del fabricant TAOS

TAOS TEXAS ADVANCED OPTOELECTRONIC SOLUTIONS

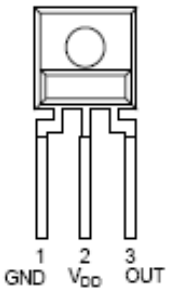
TSL237
HIGH-SENSITIVITY
LIGHT-TO-FREQUENCY CONVERTER
TAOS052D – JANUARY 2006

- High-Resolution Conversion of Light Intensity to Frequency With No External Components
- High Irradiance Responsivity . . . 2.3 kHz/(μW/cm²) at λ_p = 524 nm
- Low Dark Frequency . . . < 2 Hz at 50° C
- Single-Supply Operation . . . 2.7 V to 5.5 V
- Stable 200 ppm/°C Temperature Coefficient
- Interfaces Directly to a Microcontroller
- RoHS Compliant (−LF Package Only)

PACKAGE S
SIDELOOKER
(FRONT VIEW)



PACKAGE SM
SURFACE MOUNT
SIDELOOKER
(FRONT VIEW)



Description

The TSL237 light-to-frequency converter combines a silicon photodiode and a current-to-frequency converter on a single monolithic CMOS integrated circuit. Output is a square wave (50% duty cycle) with frequency directly proportional to light intensity (irradiance) on the photodiode. The digital output allows direct interface to a microcontroller or other logic circuitry. The device has been temperature compensated for the ultraviolet-to-visible light range of 320 nm to 700 nm and responds over the light range of 320 nm to 1050 nm. The TSL237 is characterized for operation over the temperature range of −25°C to 70°C and is supplied in a 3-lead clear plastic side-looker package with an integral lens. When supplied in the lead (Pb) free package, the device is RoHS compliant.

For automotive and other extended temperature applications, please contact TAOS for information.

Functional Block Diagram

Available Options

DEVICE	T_A	PACKAGE – LEADS	PACKAGE DESIGNATOR	ORDERING NUMBER
TSL237	−25°C to 70°C	3-lead Sidelooker	S	TSL237
TSL237	−25°C to 70°C	3-lead Sidelooker — Lead (Pb) Free	S	TSL237−LF
TSL237	−25°C to 70°C	3-lead Surface-Mount Sidelooker — Lead (Pb) Free	SM	TSL237SM−LF

Texas Advanced Optoelectronic Solutions Inc.
1001 Klein Road • Suite 300 • Plano, TX 75074 • (972) 673-0759
www.taosinc.com

ETSEIB

Terminal Functions

TERMINAL NAME	TERMINAL S PKG NO.	TYPE	DESCRIPTION
GND	1		Power supply ground (substrate). All voltages are referenced to GND.
OUT	3	O	Output frequency.
V_{DD}	2		Supply voltage.

Absolute Maximum Ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, V_{DD} (see Note 1) . . . . . 6 V
Operating free-air temperature range, T_A . . . . . −25°C to 85°C
Storage temperature range, T_{stg} . . . . . −40°C to 85°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
NOTE 1: All voltage values are with respect to GND.

Recommended Operating Conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{DD}	2.7	5	5.5	V
Operating free-air temperature range, T_A	−25		70	°C

Electrical Characteristics at V_{DD} = 5 V, T_A = 25°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{OH}	High-level output voltage	I_{OH} = −1 mA	4	4.5		V
V_{OL}	Low-level output voltage	I_{OL} = 1 mA		0.25	0.4	V
I_{DD}	Supply current			2	3	mA
	Full-scale frequency‡		500		1000	kHz
	Temperature coefficient of output frequency	Wavelength < 700nm, f_O = 50 kHz		±200		ppm/°C
k_{SVS}	Supply-voltage sensitivity	V_{DD} = 5 V ±10%		±0.5		%/V

‡ Full-scale frequency is the maximum operating frequency of the device without saturation.

Operating Characteristics at V_{DD} = 5 V, T_A = 25°C, λp = 524 nm (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
f_O	Output frequency	E_e = 21.8 µW/cm²	40	50	60	kHz
f_D	Dark frequency	E_e = 0 µW/cm²	0	0.1		Hz
		E_e = 0 µW/cm², TA = 50°C	0		2	Hz
R_e	Irradiance responsivity			2.3		kHz/(µW/cm²)
	Nonlinearity§	f_O = 0 kHz to 10 kHz		±1%		%F.S.
	Step response to full-scale step input			1 pulse of new frequency plus 1 µs		

§ Nonlinearity is defined as the deviation of f_O from a straight line between zero and full scale, expressed as a percent of full scale.